NATURE MAGAZINE

OCTOBER 1930 35¢ VOL. 16, NO. 4

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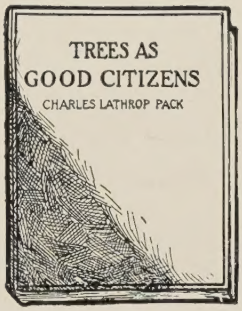

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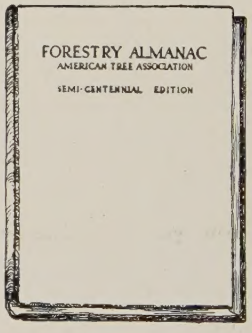

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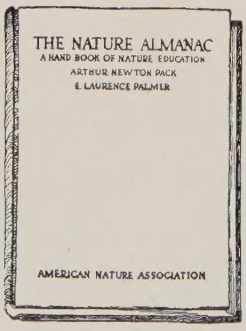

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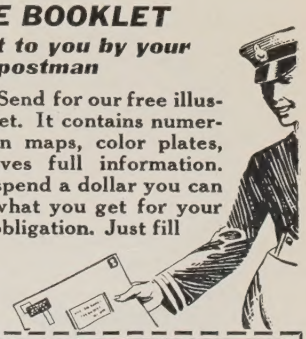

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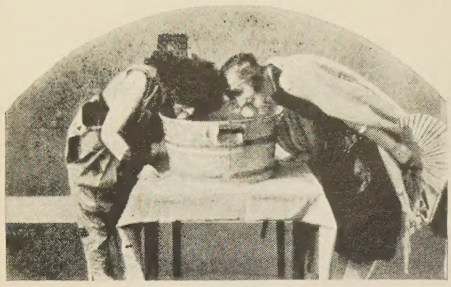


Apple Bobbing

Photographic DEPARTMENT

EDITED BY ROBERT T. LOWELL

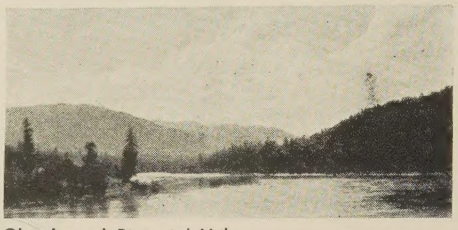
Hallowe'en Pictures

Goblins, witches, black cats and spooks of all sorts will prowl about and have full sway on the night of October 31, and while they're altogether too busily employed to pose for your camera, your own Hallowe'en activities offer a great chance for unusual pictures.

Get out your camera whether the party be for grown-ups or children. There are the bobbing for apples, the various games including the one of the ever popular donkey with a dozen or two tails, the guests enjoying the cider and pretzels—or do you have doughnuts?—individual pictures of the prettiest, weirdest, and the funniest costumes and, of course, a group of the entire assemblage.

Then, too, the making of photographic silhouettes is fascinating fun, and at the costume party you'll find many subjects that are especially suitable for this type of picture. As Hallowe'en parties are held in the evening it will be necessary to make your pictures by artificial light. This, contrary to general opinion is in reality very simple. And it is fun to try out.

We have obtained from a camera manufacturer a limited quantity of booklets telling all about making pictures at night and we shall be glad to distribute them upon request. Many subjects, of the youngsters (or grown-ups) in costume can be snapped, however, in the daytime for record purposes. They all add a lively note to the snapshot album.



Clouds and Pictorial Value

October's Clouds

Clouds add pictorial value to pictures. For securing them so that the sky area of pictures will be an artistic element and not be just a blank white space we give a few notes.

Guard against over-timing the exposure. Learn when to use and when not to use a color filter. Employ the filter to register more vividly the white, cottony clouds in a clear blue sky and when it is desired to obtain detail in the foreground of a nearby landscape.

The filter will absorb some of the very actinic blue of the sky and in thus "holding it back" the white clouds have more chance to record their images. When clouds contain heavy gray portions no filter will be required. Also, if cloud pictures are made toward sunset when the formations are tinted with various hues, so noticeable in autumn, the filter is not needed.

The increase in exposure time will depend upon the density of the filter used. There are explicit directions furnished with color filters. This department will be glad to mail to anyone, on request, an outdoor exposure guide and a leaflet telling more about color filters.

Ice Bound

What—No Pictures!

Much of what Admiral Byrd and his associates accomplished during their two years in the South Polar regions has been graphically recorded by photography. We are now being informed through the press and by magazine articles of the details.

Pictures, both motion and "still" shots, were made as the plane soared over the Pole itself and innumerable other photographic records were secured. Those of us who have seen Paramount's marvelous picture, *With Byrd at The South Pole,* can appreciate what photography can bring to the scientific world as well as how great its interest and educational value is to the rest of us.

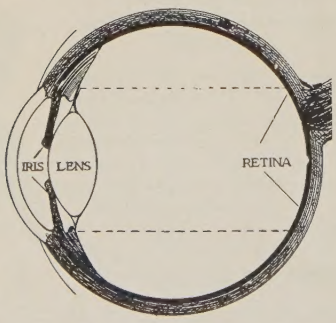
What if there were no photography? No news pictures, no portraits except drawings or paintings, of mother, father or child, no snapshot album, no authentic pictures of foreign peoples and scenes—no movies!

Someone has said that one picture is worth ten thousand words. Indeed a wise man.

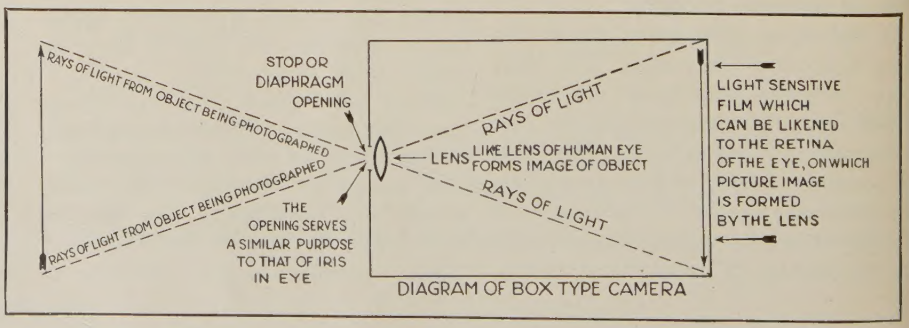
Ask Us

Various articles in this magazine are often illustrated with unusual pictures of wild life or other allied subjects. Possibly you have made similar camera studies or again would like to know more about how the authors get such striking results. The editor of this department will endeavor to get details for you and will offer advice as to how to get best results with the particular camera equipment you possess.

AN ANALOGY BETWEEN THE EYE AND THE CAMERA



See how eye resembles camera. Dotted lines indicate box type camera


RAYS OF LIGHT FROM OBJECT BEING PHOTOGRAPHED
STOP OR DIAPHRAGM OPENING
RAYS OF LIGHT
LENS LIKE LENS OF HUMAN EYE FORMS IMAGE OF OBJECT
RAYS OF LIGHT
LIGHT SENSITIVE FILM WHICH CAN BE LIKENED TO THE RETINA OF THE EYE, ONWHICH PICTURE IMAGE IS FORMED BY THE LENS
RAYS OF LIGHT FROM OBJECT BEING PHOTOGRAPHED
THE OPENING SERVES A SIMILAR PURPOSE TO THAT OF IRIS IN EYE
DIAGRAM OF BOX TYPE CAMERA

The fundamental principles of picture-making with a camera of any type are shown in this diagram

THE eye is virtually a little camera in itself. In front it has a lens which forms an image on a sensitive surface which is called the retina. The retina plays the same part in the eye that the film does in the camera.

It differs, however, in that when light falls upon the film, a permanent change is produced and by the process which is known as development the image or picture recorded can be brought out.

If the light falls upon the film for too long a time, however, the picture image is spoiled while the retina merely acts as a medium to transmit to the brain the sensation of the light that falls upon it. When the light stops, the sensation stops and the retina is ready to make a new record—to catch a new picture image.

It behaves, in fact, like a film in which the sensitive material is constantly renewed.

The eyelid can also be likened to a part of the camera—the shutter—in its function of opening and closing and shutting out the light when desired.

Edited by

ELEANOR WALKER

In these days of "bottled sunshine" and "sun lamps", "irradiated foods" and "sun baths", when a white complexion is such a disgrace that as a last resort one may simulate a coat of tan by applications from a druggist's bottle, what could be a more logical vacation place than South Africa, that land of gorgeous sunshine. The weather man has certainly fixed that country up with a schedule that makes it possible to take one glorious sun bath the whole year round, for when it's the rainy season in one part, it's the sunny season in another and vice versa. Even their winter which lasts from May or June to September or October is pleasantly mild.

Perhaps these doctors are right about "bigger and better" sunshine making "bigger and better" babies, for statistics show that the descendants of the early settlers in Africa are taller and huskier men and women than their ancestors, and than the average of the white race. We should add, however, that the vast upland region between three thousand and six thousand feet above sea-level is the area that seems to cause the genus homo to thrive so healthily. South Africa, of course, has been famous for years as a place where sick folks grow strong and upright, but its possibilities for the normally well person who wants to keep vital and vigorous are only beginning to be realized.

Room to breathe—that's another South African tonic. You can stand up in the middle of the Karoo some morning, stretch your hands over your head, fill your lungs with ozone and not see a habitation for countless miles, much less hear the jangle of a telephone or the honking of traffic. The only noise may be the gibberish sounding Afrikaans with which your transport rider vociferously orchestrates the ox-teams into action. These South African oxen understand only one language—to cajole, wheedle or threaten in English or French brings a reaction of utter stolidity. But let your Dutchman start his vocalizing and he gets results.

The dominating note of South African scenery is its huge scale—vast stretches of upland, vast stretches of desert, vast stretches of bleak mountain range—vast panoramas to be seen from mountain and sea-cliff. Even the monotony of endless miles of flat, bush-dotted veldt—like the Karoo—has its own charm of never-ending expansiveness. "Big game" has always been somewhat synonymous with "Africa" to us,—and surely the setting for "big game" of forest, plain and jungle is appropriately huge.

Generally speaking, South Africa is not a pretty country—the mountains are bleak rocks bare of forests—the plains stretch endlessly from horizon to horizon—even the rivers thread their way through tall rocky ravasses rather than through smiling green meadows—but if in scenery you respond to strength and boldness, to virility and grandeur—you will love South Africa. You

DEAN CORNWELL, whose great mural decorations will soon adorn the new Los Angeles Public Library, traveled thousands of miles to view gorgeous new scenes, strange costumes, interesting faces, ancient places. But he was inexperienced with cameras.

"Take along a Graflex," friends told him—"it eliminates guesswork in focusing."

The "Jerusalem Drink Seller" above, is one of a fine collection of human interest photographs made by Mr. Cornwell with his Graflex, on the trip. He discovered what every traveler and artist should know—that a Graflex camera puts superior pictures within everybody's reach.

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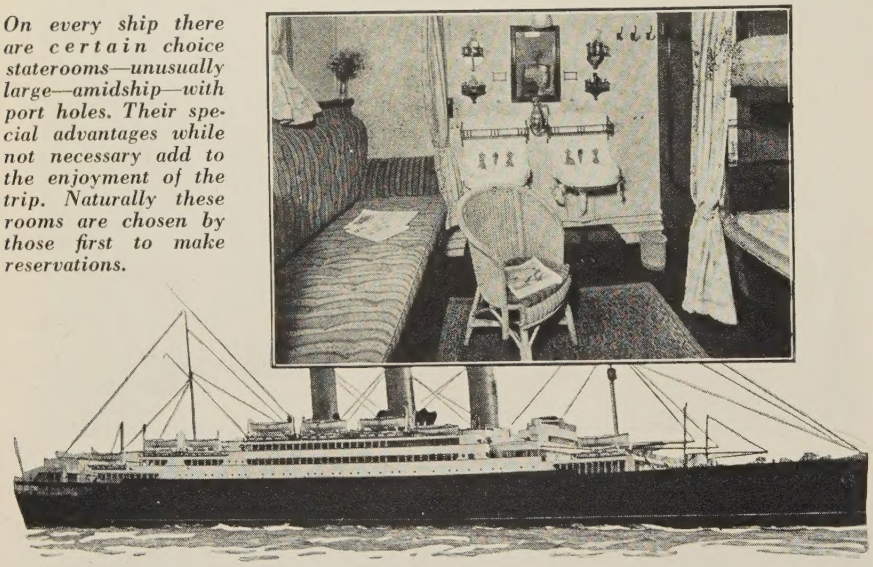

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may even come and see and stay, for subdivision has not yet assigned a man to a thirty-foot lot—and he who brings vision and will may here work out for himself and his family a future more satisfactory than in many more fully developed countries.

Assuredly, if hospitality makes a happy traveller, South Africa should see more of them,—for the courtesy and kindliness shown the stranger in their land is remarkable.

And who are the South Africans? May we revive your memory by a short stretch? Back in the 17th century in the days when Europeans were searching the New World for gold and pirates were searching the seas for ships carrying that treasure home, a group of Dutchmen landed at Capetown for a far less romantic purpose—namely, to raise cabbages. The new trade route to India around the tip of South Africa was a long sail. Even the speediest mariner could not make the trip in less than six months, and his need for fresh green food to prevent scurvy among the sailors was great. The Cape of Good Hope was the strategic location for re-cabbaging—and hence the advent of the Dutch.

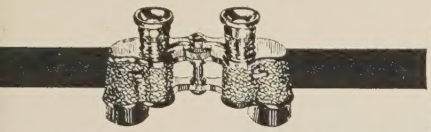
That was almost three hundred years ago. Early in the nineteenth century, Great Britain acquired control of South Africa and as the British came into administrative offices, the pioneering Dutch pushed farther and farther north, out of reach of a supervision that to them was somewhat irksome. "Voortrekkes", these men and women of the migrating ox-carts were called—and the service they did in pushing back the natives and opening up new country was a big factor in the development of what later constituted Union Country.

These Bible-like patriarchs carved out republics of their own—the Transvaal, Orange Free State, etc., most of which were later united into the Union of South Africa —a British possession with dominion status. The greater policy of South Africa as a unified country bound together for mutual progress is gradually taking the place of preference for local independence and racial individualism. Cecil Rhodes was the big figure in pushing north the boundaries of British possessions in South Africa.

There have been immigrations of many other European races into Africa, but the most numerous white race is still the Dutch, and after them the English. The blacks, however, outnumber the whites, five to one. Both English and Afrikans, a sort of Dutch patois, are official languages. Most of the unskilled labor of South Africa, domestic, industrial and agricultural is done by Kaffirs, as the blacks of all tribes are called.

Your route through Africa will depend a lot on the time of year that you visit it. We are merely suggesting the following schedule as one that hits the high spots:—Capetown, that city of an almost theatrical location with Table Mountain as a backdrop and the blue sea in front, and out of Capetown the Marine drive; from Capetown you may go by rail through the orchard country to the wild uplands with their pointed crags jagging the sky, their steep-sided gorges boulder strewn, making a first stop at Kimberley to see the diamond mines. From Kimberley go right into Southern Rhodesia, stopping at Bulawayo so as to see Rhodes' grave in the Matopos, and the

SEE IT ALL!



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TRAVEL DEPARTMENT

"world view" there, so beautiful that Rhodes and his black chief friend,—both chose this spot out of all South Africa as their final resting-place. Victoria Falls, your next sight, is undoubtedly one of the world's water wonders. They are higher than Niagara, and they empty into a very narrow chasm which adds to the confusion —"and charm!" Before you leave Rhodesia you may wish to visit the Zimbabwe Ruins, that possible ancient source of King Solomon's gold. It's not one of South Africa's most imperative sights, although it is one of the few relics of an older civilization, outside of the Bushman cave drawings, to be seen in the whole region. From Bulawayo we go to Johannesburg.

Johannesburg is the center of the gold industry, an exciting and gay city, not so much for its outward aspect, though that's fair enough, as for its air of things doing, of vitality and vigor. It is the social center of South Africa.

Pretoria, just a short run from Johannesburg, is the administrative capital of the Union, and as placid as Johannesburg is gay. The Union Building there is one of the most notable works of South Africa's notable architect, Herbert Baker.

From Johannesburg you go to Ladysmith to branch off to the Drakensberg, those huge bleak mountains that rear themselves into a thousand rocky silhouettes against the sky or open their sides to make a thousand-foot chasm for the unwary foot.

Then right from the desolate Drakensberg you travel to buzzing little Durban, fashionably resortified, and gloriously equipped for sea-bathing and sports in general. You'll see many East Indians in Durban but that's another long story involving even Mahatma Ghandi.

At George you may be a bit homesick perhaps. It is such a pretty, homelike town, with wide streets and tall oak trees. You can really justify your stay in George because some of the finest tours of the coast start from this town, the trip to the Wilderness, a retreat of hills with the sea beyond —to Knysa with its sharp cliffs enclosing a bay—to the Outeniqua Mountains and the famous tortuous mountain drive up toward Montagu Pass.

This short sketch is inadequate. If you want more information won't you write me or the Director of South African Government Bureau, 11 Broadway, New York?

Vocational Readings

While *Readings in Vocational Life* is somewhat beyond the sphere of Nature Magazine, we are glad to commend it as an excellent collateral reading in courses dealing with occupations or elementary economics. It supplies short, pithy statements by leading personages on economic principles and on different trades and professions. These may be classed in three types, —informational, interpretative and imaginative. The work has been prepared by Howard C. Hill, Assistant Professor of the Teaching of Social Science at the University of Chicago, and is published by Ginn and Company.

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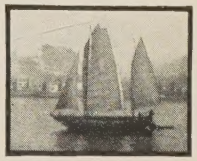

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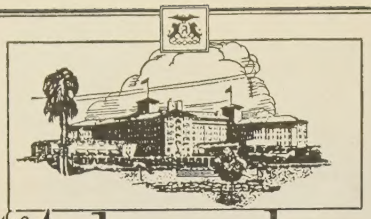
See Page 243 for Announcement of Caribbean Cruise



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NATURE IN PRINT

Rose Who's Who

From the presses of the Macmillan Company comes *Modern Roses* by J. Horace McFarland. It is a veritable Who's Who of present day rosedom and it is entirely made up of brief descriptions of 2,511 varieties. The volume, which was prepared for the American Rose Society, contains 48 color plates and 31 sepia pictures of the roses described. The descriptions are presented without superlatives and the book should be of inestimable value not alone to nurserymen and seedsmen but to anyone who goes in seriously for rose growing. It is listed at five dollars.

Dog Breeding

Will Judy has written another practical dog book, this one being entitled *Principles of Dog Breeding*. In it is presented all the phases, problems and requirements of this fascinating calling. It is, of course, of special interest and value to the dog breeder, professional or amateur. At the same time the book should be of no small interest to the individual interested in well bred dogs. It is attractively printed by the Judy Publishing Company, Chicago, and sells for two dollars.

Bulletins Received

Other interesting bulletins recently received include *An Annotated List of the Important North American Forest Insects* by F. C. Craighead and William Middleton, brought out as Miscellaneous Publication No. 74, U. S. Department of Agriculture; *Four New Raccoons from the Keys of Southern Florida* by E. W. Nelson, Publication 3066, Smithsonian Institution; *Nature Trails in Cleveland* by Edmund Cooke, Publication No. 10, New Series, of the American Association of Museums.

Noted Achievement

Fifty-two productive years in anyone's life seems a long time, but when they have been as prolific of accomplishment as such a period has been in the noted career of Henry Fairfield Osborn it seems almost inconceivable that a man could have achieved so much. This is emphatically called to attention by the publication of *Fifty-two Years of Research, Observation and Publication*. In this volume of 160 pages Dr. Osborn's contributions to research are listed and annotated. His published writings are listed in a chronological bibliography covering the years 1877 to 1929, and in a classified bibliography. There is a chapter by Dr. Osborn on ideal methods of research, and a listing of the memberships he holds and associations he has made in the scientific world. This volume should, of course, be in every reference and scientific library. It is published by Charles Scribner's Sons, New York, and sells for $1.50.

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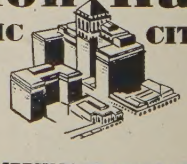

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Colorful Cacti

With cacti coming into increasing favor as garden denizens, a recent bulletin of the University of Arizona entitled *Color Schemes of Cacti* is of special interest. It is written by John M. Breazeale and is published by the University at Tucson. It contains four color plates of cactus blossoms and a most interesting discussion of the desert plants from the color point of view.

Anna Botsford Comstock

With the recent death of Anna Botsford Comstock, "the Mother of American Nature Study," and a former associate of the American Nature Association, there passed a pioneer personality who first blazed the paths of Nature Study in the United States and who has been for the past thirty years a profound influence in the field of education.

Mrs. Comstock passed away at her home in Ithaca, New York, during the latter part of August at the age of seventy-six years. Just a few days previous to her death she gave her last lecture at Cornell University, where she was emeritus professor of Nature Study, and where, since 1899, she had taught and inspired the leading figures in present-day Nature education.

Mrs. Comstock was chosen in 1923 by the National League of Women Voters as one of the twelve greatest living American women. Although primarily distinguished as an educator, she was a wood engraver of note, having exhibited at national and international expositions. She was also the author of many books, most of them devoted to Nature or Nature study.

Educated at Cornell University, whence she graduated in 1878, Mrs. Comstock studied art at Cooper Union under John P. Davis. She became interested in Nature study, however, and in 1899 was appointed assistant professor of Cornell's extension work in Nature study. She lectured at Leland Stanford Junior University during the early part of the century, and from 1913 to 1920 was assistant professor of the extension work there. In 1917 she became editor of Nature Study Review, and when that organ became merged with Nature Magazine in 1923, she became an associate in the work of the American Nature Association. She was made full professor at Cornell in 1920, and professor emeritus in 1922. Continually interested in the field she was so instrumental in opening up, she was present at nearly every conference and meeting of importance, and greatly influenced educational policies.

Among her writings are: *How to Keep Bees, Ways of the Six-Footed, How to Know the Butterflies, The Pet Book,* and *Confessions of a Heathen Idol.* Her *Handbook of Nature Study,* though published in 1911, is still considered an authoritative work in the field.

The extent of Mrs. Comstock's influence in Nature study and education can hardly be accurately estimated. She has inspired probably more men and women of courage and intellect to pioneer in a new field than any other person, and she worked so assiduously and zealously that in thirty years the orphan subject she nurtured became a giant, safely entrenched in American education. It will remain for posterity correctly to ascertain her important place.

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NATURE MAGAZINE

PUBLISHED BY THE AMERICAN NATURE ASSOCIATION

To Stimulate Public Interest in Every Phase of Nature and the Out-Of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

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VALUES

An Editorial

SITTING at an editorial desk too long is likely to blurr perspective. The editor has only a voluminous correspondence of comment and inquiry to guide him. Often the comment is critical, and appreciation of this article and that feature is more rarely translated into a letter. Just as an athlete, surfeited with training, goes stale, an editor is likely to fall into the same state. It is a mental thing, largely, and for him who presides over the making of a magazine there is one antidote—chuck your work on an assistant's desk and head for the open spaces.

We have just done that. With one of the American Nature Association's parties we have climbed mountains and ridden trails in Jasper; poked about along the glorious, unspoiled shore of British Columbia; stalked within fifty feet of a mountain ram on high mountain shale; seen a rare timberline sparrow and heard his clear song; caught steelheads in a landlocked, unfished lake; ridden fast rivers into the wilderness. Cobwebs have been blown clear of the editorial brain. Contacts have sharpened the mental focus and any staleness of viewpoint has gone. Of the many things we saw, and of the many memories we bring back from the outdoors, there are two which seem to us to invoke thought.

We had an afternoon in Chicago before our train left for Jasper. Over beyond the Field Museum in Grant Park there is a round-domed, brown colored building. It is the Adler Planetarium and there we went. Parked around it were automobiles from many states, and the corridors inside, lined with astronomical exhibits, were crowded with a varied people. It cost twenty-five cents to get in and it was obvious that to most of the people there a quarter was a quarter and not just a coin. People were pouring in and standing in line for the lecture about to be given. We entered a circular room with a domed white ceiling. About the wall, some seven feet from the floor, was the skyline of Chicago in silhouette. In the center of the room was a complicated machine. The room seated, in circles, six hundred persons. It was crowded when a young lady came in and began a lecture on astronomy. The lights dimmed. It was dark. Then there flashed on the ceiling above, the heavens in all their glory. For one hour the young lady talked to an audience that did not even cough. She took them to the North Pole and showed them the change in the Heavens. She carried them through the seasons and they watched the movements of the planets. Day and night passed. The sun and the moon, the stars and the planets moved about on the ceiling above. When we came out lines were formed for another six hundred to fill the room.

We boarded our train for Jasper and finally found ourselves at beautiful Jasper Lodge, where are all the comforts of home and more. The guests were for the most part those who enjoy ample means for travel. Many could afford to stay in this lovely spot for weeks at a time. They played golf, and bridge, swam and, now and then, rode. They were charming, healthy folks, "roughing it" out there in the Northwest, but with evening dresses along, plenty of hot water and all kinds of service.

The morning after we arrived in Jasper we took to the trail. Night found us at one of the world's most glorious spots—Maligne Lake. This perfect lake sparkled for eighteen miles before us, lapping at the feet of jagged, snow-capped peaks which glistened in the sun, turned rosy as it set and were bathed in purples and blues in the fading afterglow. We had come by an easy trail to Maligne Lake Chalet. There we slept on comfortable cots; ate quantities of excellent food. To be sure we sat on a bench and we were a dozen at the table. We washed in good white enamel bowls with water from its companion pitcher. We packed our grub up the lake and brewed tea over a fire on its shore. We climbed a glacier. We climbed a mountain. And all the while we made ours the memory of this perfect scene.

"How many come out here during the season, Major?" we asked Fred Brewster.

"Two hundred and fifty-four, last year," he said. "There were fifteen thousand who visited Jasper. Sixty went over Shovel Pass, our next trail."

Fifteen thousand people visited Jasper Lodge in one season! Less than two per cent saw anything of Jasper Park! Certainly fifty per cent were able-bodied and could have ridden or walked the eleven miles from Medicine Lake to Maligne Lake. They got birdies on the golf course but never saw an Arctic horned lark frantically trying to draw man away from its nest on a Maligne Lake mountain side. They played no-trump hands cleverly in the lounge but they lost the ace of scenery. They went to Jasper Park and came home without seeing it. While back in Chicago people of modest means were paying their quarters to line up and have a glimpse at one of Nature's greatest works.

We'll not try to draw any conclusions from these two instances which struck us so forcibly. We just pass them on as, perhaps, worthy of thought. After all, it is just a question of values which often seem to us rather badly muddled.

THE CURSE OF SIZE IS HIS. HIS WILD, UNHUNTED WORLD HAS SHRUNK UNTIL HE IS MADE ALMOST MONSTROUS IN THE LITTLENESS OF IT

NATURE MAGAZINE

VOLUME 16 OCTOBER · 1930 NUMBER 4

THE FLORIDA FLATWOODS

THEY MAY FORM PART OF A NATIONAL PARK

BY DALLAS LORE SHARP

ILLUSTRATED BY R. BRUCE HORSFALL

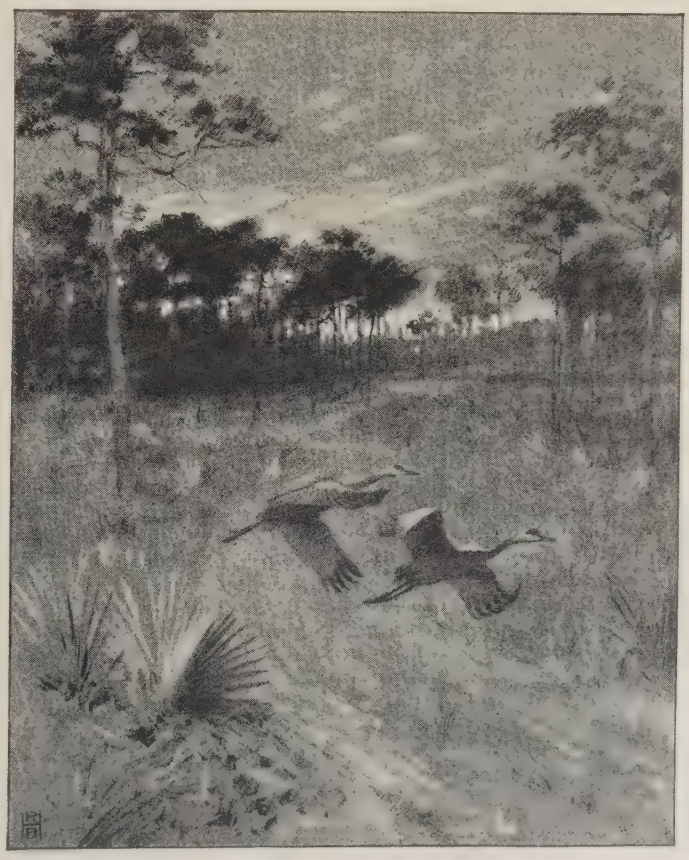
"You all go up to Jupiter," said the cracker, "then down the road toward Indian Town into the piney woods, which is where I seen them whoopin' cranes, come two days since." And to make my finding of the birds sure he did some imitative whooping, a dismal, guttural, indescribable croaking sound as of lonesome jackasses, angry camels, and motherless lambs, which yet suggested birds—wild drakes behind the sedges, and honking ganders up among the stars.

The noise was incredible. I suspected a straight improvisation for the sake of his innocent visitor. So I asked my cracker friend to repeat the whooping. The encore was identical, the same cacophony of beasts and birds, only this time more distinctly honking, the wild-goose note a throbbing, familiar refrain.

He evidently didn't know a wild goose from a sandhill crane. And as for whooping cranes, there were none in Florida, and few in any of their native haunts, so nearly extinct is that big bird. It was the big, brown sandhill crane, a Florida bird, and still to be found in the flatwoods about Lake Okeechobee, which I was eager to find. And this first man with a gun to be questioned had seen the birds only two days since! Or else he hadn't.

I sped away for Jupiter, nevertheless, not caring much if the pitch-pine son of the flatwoods was tenderfooting me. Sandhill cranes were a beautiful excuse for a long February day in the Florida pines. I took the road toward Indian Town, and was soon some fifteen miles within the odorous woods, woods unlike any other in our country, a level, open, interminable growth of individual trees, everywhere about you, yet nowhere near you, luring, alien and strangely impenetrable.

Stopping in the narrow, sandy road to pick up a dead hawk, a male broad-wing, in perfect nuptial plumage, the target of some passing hunter, I stood a moment in the utter silence of the scene. The tall, smooth-stemmed trees, as plumed as palms, single and widely spaced, were planted all about me, yet, though I had seen no house for miles, the wall of the forest was still ahead, a shadowy girdle extending out around and closing far behind me. The mate of the dead hawk swept down from a pine top and swung up into one nearer me with a piercing whistle, the protesting silence closing after it with a cry of pain. Feeling that I had not yet entered the woods, and seeing nothing in the flat, uninteresting open space about me indicative of cranes, I was about to move on toward the darker wall of the forest beyond, when I was halted by a weird sound—the voice of my cracker friend! Or was it



"ONE OF THE LARGEST OF OUR AMERICAN BIRDS, A STRIKING FLATWOODS FIGURE, AND ONE WHICH SEEMS DOOMED"

the voice of the cranes? From all around the distant, shadowy rim of the woods at once it seemed to come, croaking, cackling, ventriloquial, and as eerie as the mad laughter of some menagerie in the night. Except for the uncanny skill of the cracker who had instructed me I should never have dreamed it the speech of birds, as down the intercepted aisles of the forest it reached me in confusing echoes as from innumerable hollow halls.

Cranes? But things didn't happen this way outdoors —not to me anyhow. I may have expected to catch a pair of dodoes, possibly, but as for casually wandering into the infinite flatwoods of Florida expecting to see a sandhill crane—that was for the cracker. And I really thought the old boy was handing out something in the same line to the "pink and white professor of birdology from a young ladies' seminary in the effete East," as once a far-western newspaper so described me, and as doubtless I appeared.

The memory of Dallas Lore Sharp, that gallant fighter for open spaces, whose recent death left such a void, will always keep fresh the fight to save the nation's wild life. We are proud to present this article, one of the last from his pen, and, later, "My Jungle Study", a marvellous analysis of tropical life.

But this was nobody's joke, nor a trick of my too responsive imagination. I was listening to the clamor of sandhill cranes, and nothing wild in Florida, except the sea-cow and the horrid lurking rattlesnake of the Everglades, so excited me over the prospect of seeing.

Standing four feet in his stockings, as tall as the great blue heron and nearly as heavy as the wild turkey, this crane is one of the largest of our American birds, a striking figure in the flatwoods, and one which seems doomed to pass away.

The curse of size is his. His wild, unhunted world has shrunk until he is made almost monstrous in the littleness of it. Any wild thing standing more than half the height of a man, magnified with spreading wings and a clanging tongue, has the mark of the gun upon him. It is not for his feathers, though the plume-hunter has not yet passed, nor for his flesh, though the Seminoles and the crackers eat the bird, that he will be destroyed, but for the very wildness and the bigness of him.

No wild rival to man can be tolerated in the temperate zone. Behind the barrier of the polar circles the bear, the walrus, the musk-ox and the reindeer may be forever protected if the nations will agree. Within the liana-roped jungles on the equator the jaguar, the gorilla, and those other forms mightier than man can be given room and verge enough if some inter-

"THE PINELANDS OF FLORIDA ARE ONE OF THE EARTH'S EXPRESSIONS OF ROOM, COLUMNED, CURTAINED, EVEN WALLED"

national treaty for their protection can be quickly arrived at, though more men than Carl Akeley may have to pay with their bones for such a compact. But where in the interminable reaches of the Everglades and the pine woods of Florida will the realtor, the planter, the lumberman, the sportsman and the swarming winter visitor grant the sandhill crane an habitation unenforced?

The pinelands of Florida are one of earth's expressions of room. The sea and the prairies are sheer extent, sky bound, horizon scribed. The peaks of mountains, like the Rockies, fill one with the sense of pure space. In the Florida flatwoods the feeling is of room, columned, windowed, curtained, even walled, yet the swiftest travel leaves one always entering, never quite across the threshold, so uncrowded towers each plume-crowned, knightly tree.

For their sea-level situation as characteristic and as interesting as the fog-bound firs on the coast of Oregon, or the beech and maple in the hardwoods of New Hampshire, the pines of Florida cry aloud for sanctuary. There is nothing in the Sierras, or in the Rockies, or in the Great Smokies, like them, or more fit for a national park. Spread over much of the dry, sandy southeast, the flatwoods come into their perfection of flatness, into all that gives them form and meaning, in Florida. Every wild creature native to them needs protection, but the State and the Federal Government should together set aside some thousands of acres of these pines for the very woods' sake, not to mention the sandhill cranes. Under such control the parks and forest reserves of the West are pastured, and in other ways found profitable, as in Florida they might be worked even for pitch and turpentine, possibly, without harm to the trees or to any wild thing. A vast Pinelands Park is the immediate national need in Florida.

Ours is a pine-bound country. Each of its four corners is embossed with a different forest, so extensive as to stamp the corners with the sign and seal of a species of pine: the seal of the white pine in Maine, of the sugar pine in Washington, of the piñon pine in California, and of the long-leaved, or southern pine in Florida. Mixed with the long-leaved, but closer to the coast and farther down the peninsula, are great tracts of slash pine, just as in the Southwest, above the piñon line, up to an elevation of eight thousand feet along the dry ridges of the Sierras, run forests of the massive *Pinus ponderosa,* the yellow pine, with trunks six feet across and tapering two hundred feet into the air.

No four forests on earth of the same family could be less alike, or seem more essential to their landscapes. But these separate, unique trees disunited into the flatwoods merit preservation if only for their dissenting individualism.

"IT IS NOT FOR HIS FEATHERS NOR HIS FLESH THAT HE WILL BE DESTROYED BUT FOR THE VERY WILDNESS AND BIGNESS OF HIM"

WASHINGTON'S DOOMED TULIP TREES

BY A WOODSMAN

THE tulip trees bordering Washington's Sixteenth Street, the Avenue of the Presidents, at whose foot stands the White House, are dying a lingering death. Planted half a century or so ago and deserving to be now in the first flush of their beautiful maturity, they are already passing. Each spring some fail to put forth their leaves. Each storm sends crashing to the ground its quota of dead or dying branches. Dozens of these trees still rear toward the sky their serried crowns, battle-scarred and ragged.

On this broad and beautiful boulevard live many notables of world-wide fame. Here stand some of the most magnificent of America's historic mansions. Several prominent scientific and educational institutions have their homes here, among them the American Nature Association. And not one of the many scores of tulip trees that line this famous street retains that graceful and majestic symmetry that is natural to this species.

The relentless foe that has brought to such straits this beautiful plantation, set here by a generation now passed to gladden the eyes of generations yet unborn, is not one that works with shell or bomb or poison gas, but is a tiny insect of one of the lowliest tribes of that lowly class. It is the tulip-tree scale, *Toumeyella liriodendri,* a species native to America, and the main enemy, save man and old age, of this tree of ancient lineage and consummate grace and beauty.

ABOUT TO DIE IT SALUTES YOU

This beautiful tulip tree adjacent to the grounds of the American Nature Association passes for want of care, like hundreds of its fellows

Liriodendron, represented by species differing little from our own favorite, grew in the moisture-laden forests of America from Greenland to our Middle States in Cretaceous times, before any but the most primitive mammals had appeared. The tulip tree was present also in Europe in ancient geological times. There, however, it has been long extinct, probably because its southward retreat was blocked by the Mediterranean when the glaciers from the north drove all life before them. Here in America, however, the tulip was able to outstrip its pursuers, and there has been an unbroken succession of individuals of this magnificent species from those distant days to the present. Our beautiful tree, *Liriodendron tulipifera,* now grows in suitable habitats from our Gulf Coast north to southern New York and west to Texas and Wisconsin.

But—asks the tree lover—is there no way to destroy the deadly scale insect, so close an associate of the tulip tree that it is named for it? The entomologists advise us that it can be killed by a miscible oil applied to the twigs on which it passes its quiescent life. But the remedy must be applied in time, just as we must attack tuberculosis before the ravages of the disease have driven the patient to his death-bed.

The tulip scale is well known both to entomologists and to foresters as an enemy of its host. Its presence in dangerous numbers is as easy of detection as that of the gypsy moth or the canker worm. True, it does not devour the leaves and so betray itself by its trail of bared branches. But where its legions encrust the delicate terminal twigs, those that produce and bear the leaves that are the breath and life of the tree, and suck from them their life blood, the exudations of the pests fall in a fine spray that may be felt on the hands or face. These myriad droplets accumulate until a gummy brownish layer covers the surface of sidewalk or pavement. The evidence is unmistakable and impossible of concealment to those with eyes for such things. In the forest the insect may be overlooked, but here its ravages are usually scattered and of little import.

Why, then, has this devastating pest been suffered to increase and spread until this double row of once majestic trees, growing on one (Continued on page 263)

GARDEN LIFE-SAVERS

DIGITALIS—AND WHAT IT HAS DONE

BY ERNEST E. STANFORD

In connection with this admirable article it is interesting to note that digitalis is on the free list in the Smoot-Hawley Tariff

J. HORACE MCFARLAND

BEAUTY AND SERVICE

With the magnificent flowers above, and the life-giving leaves below, foxglove serves both soul and body of man

THE STATELY foxglove by your garden walk is a thing of beauty.

It might, on occasion, take on quite a different significance. More than one elderly gardener, and doubtless some younger ones, have, quite without knowing it, owed their lives to that same majestic biennial. For foxglove, to the initiate—physician or pharmacist—means digitalis, which in turn denotes nothing more than the huge, velvety leaves of the garden favorite, dried to a crisp, ground to almost impalpable powder, and prepared in some of those various ways which make "your druggist more than a merchant."

Foxglove is one of the few old herbal remedies which science has tested and re-tested only to prize the more. The manifold herb-teas dear to our grandmothers—bitter as gall and therefore highly valued—have mostly gone into therapeutic discard, to be replaced by the coal-tar products of that scientific ion-juggler, the chemist. But digitalis stands supreme in its field.

Digitalis, in fact, is the heart tonic par excellence. It is *the*

BUREAU OF PLANT INDUSTRY

WILD DIGITALIS IN THE PACIFIC NORTHWEST

Like a million tiny flamelets the wild foxglove plants blaze against the green background of Oregon forests, furnishing a natural supply that the stockman would be glad to see harvested

specific for certain particular afflictions of the cardiac organ. In the hands of the specialist the precision of digitalis rivals that of the keenest scalpel in the rubber-gloved grasp of his brother, the surgeon. But let the "self-healer" and the quack beware! It is axiomatic that any substance of sufficient physiological action to be of real medicinal value is also a poison when ignorantly or unwisely used.

The virtues of digitalis are demonstrated, but their calculation defies the analysis of the chemist. This smacks of the old-time patent-medicine label, except that it happens to be true. The chemist can, of course, extract several definable substances and speak learnedly of glucosides and saponins. But while he can analyse a simple thing like cinchona bark, containing quinine and two or three other alkaloids composed of such trifles as methoxy-methyl-quinoline nuclei and things like that, and estimate its medicinal value almost as accurately as he can determine the proportion of H_2 and O_2 in chlorinated city water, with digitalis he has to pause. The chemist calls the pharmacologist, and the pharmacologist calls the cat.

DR. H. C. FULLER

READY TO GO TO WORK

While Europeans use mainly second-year leaves, Americans cut the yearlings. An acre of such plants yields about six hundred pounds

Probably if the cat has any notion of what it is all about, he is hard to catch. The pharmacologist, however, usually knows a small boy who is wise in the ways of cats. The cat being provided, the pharmacologist etherizes him carefully. Despite what one hears and can never trace to any definite source concerning the cruelties of the "vivisectionist" this step is invariably carried out. The cat provides the sharpest of reasons—several in each paw and several more in the mouth—why this procedure should not be neglected, even if mercy did not demand it.

When the cat is thoroughly etherized, the pharmacologist deftly opens a certain vein, and carefully conducts therein a carefully measured liquid preparation of digitalis. Presently the cat's heart stops, in a certain definite manner. From the viewpoint of the cat, there has been an overdose. But from the viewpoint of the pharmacologist, the amount which has produced this fatal result provides a very accurate means of computing the proper human dosage of that particular preparation. The cat is dead, but the standardized preparation in the hands of the specialist aforesaid becomes an instrument of precision for the saving of human life. During the World War, when digitalis was in greatest demand for army purposes, countless cat draftees laid down their lives that human conscripts might live, and suffered less in doing it than the steer whose loin you shared for dinner.

Besides the cat, that other little hero of the laboratory, the guinea-pig, and also the green frog from the lily-pad, are used to determine the strength of digitalis.

The foxglove that saved your rich uncle's life the other day, most probably, came from nobody's garden. Scattered along the roadsides and among the mountains of southern and central Europe the tall spikes of red-purple bells grow wild. Here the peasantry of the region—the old men, women, and children, for the most part, earn the equivalent of a few cents per day by picking and drying the soft leaves of the "Fingerhut," as the Germans know it. Occasionally—and for the best quality of drug—it is cultivated, but here again cheap labor is essential.

The World War, of course, interfered with all that. The able-bodied men of Europe marched away, and the old men, women, and children who had formerly collected digitalis and other drugs had to attend as best they could to the ploughs the men left in the furrows. Drug collecting largely stopped, at the very moment that all nations, and the armies in particular, needed such products as digitalis. Then, too, the principal drug-producing countries were the Central Powers, and the Allied supply was cut off.

Fortunately for America, various people in this country had for some years been experimenting, in a quiet way, with the production of digitalis and certain other medicinal indispensables, some as a sort of hobby, and some more seriously in effort to provide a domestic supply to replace imported products that too often were variable or inferior in quality, as cheap-labor products are likely to be. Soon, scattered quite widely throughout the United States, were many little patches, usually an acre or less in a place—of drug digitalis, and the American cat made the acquaintance of the home-grown product, finding it, usually, much more potent than the imported. Digitalis was soon supplied in quite sufficient quantity to supply the American market, Army and all, and some was even exported.

This result was not attained wholly casually and without effort. Anyone who has had foxglove in a border knows that the tiny seeds may spring up by the thousand-

BUREAU OF PLANT INDUSTRY

FIRST YEAR PLANTS UNDER CULTIVATION ON A DIGITALIS FARM

It is no small matter to get them started, and harder still to keep them clean. All in all, digitalis-growing has its drawbacks

thousand under favorable circumstances of soil-moisture, crowding themselves to death by very number. But he also knows that foxglove seed, drilled in a row or broadcast in a field, will usually remain drilled or broadcast, and that the starting of foxglove requires careful handling of the germination process in hot-bed or seed-bed and also most careful transplanting, for however robust the plant may appear six months later, the young seedlings are fragile.

The seeds, apparently, are fertile enough, but small, very small. If you count carefully, you will find that 5,815,280 make a pound—a number which in such seeds as horse-chestnuts or cocoanuts would make quite a respectable pile. Furthermore, if you dissect the seed carefully, you will find that the embryo plantlet is not fully developed, like that of the pea or bean, but is a sub-tiny thing surrounded by stored food, something like that of a castor-bean on a microscopic scale, and that it has to develop further by use of this stored food before it can set up in business as a chlorophyll-bearing carbohydrate —and as a glucoside factory. If the seed dries out while these little formalities are taking place, all is over. And it takes very little sun-baking to accomplish that result. And if it is buried deeply enough to be considered buried at all, it is buried indeed.

As a field plant, the foxglove has some advantages which are not shared by all vegetable drugs—belladonna and ginseng, for instance. If and when it gets really

U. S. NATIONAL HERBARIUM

U. S. NATIONAL HERBARIUM

TWO OTHERS WHO DO THEIR GOOD TURN DAILY

Crown bark, or Cinchona officinalis, at the left, is the source of quinine, the antidote to malaria, and the leaves of Strychnos nux-vomica, an Asiatic plant, furnish the valuable drug, strychnine

started it is quite hardy as far as actual cold is concerned —though subject to winter-killing if the ground repeatedly freezes and thaws and breaks up the fibrous root-system. Diseases trouble it little, and bugs of nearly all sorts shun the fate of the cat by avoiding the glucosides.

Of one disadvantage common to cultivated drugs digitalis has more than its share. You recall that the digitalis in your hardy border did not send up its purple spike the first year, but prepared for that swan-song-in-color by means of a dense bunch of velvety leaves, borne close to the ground on an all but non-existent stem. This close-growing bunch of leaves, if in sod or litter "in the wild" is relatively free from dirt. Further, if one uses only the leaves of the second year, as does the European drug-gatherer in general, the leaves are up in the air and still further protected by distance from ground-spatter. The first-year clump of leaves in cultivated ground, however, gets from every rain a plentiful spattering of dirt, which refuses to evaporate from the sticky, hairy surface when the shower is over, and which is thereafter almost impossible to remove. The drug-buyer objects to the weight of material which is not drug; the grinder protests that the sand ruins his machinery. The Government inspector condemns it for transgressing the legal requirements for cleanliness. The specialist, if it ever reached him, would declare:

"My instrument of precision must be tincture of digitalis, and not an infusion of somebody's garden."

Soon after the war, the American drug-growers, who had carried on in spite of all these handicaps, were left with a sense of duty patriotically performed, and with very little else. While the acreage required to supply the nation's demand for digitalis is somewhat larger than that devoted to orange-growing in New Hampshire, it is still inconsiderable as compared with that of almost any agricultural crop that might be mentioned. If an acre of digitalis yields six hundred pounds of dried leaves, as with good luck it may, and the country's average annual need is 35,367 pounds, as computed from a series of recent years when domestic production has been negligible, one farmer with sixty acres devoted to foxglove could supply the whole United States—a thing he could hardly accomplish if he devoted the sixty acres to winter wheat, pineapples, horse-radish, or silver foxes. But if the farmer planted a hundred acres, no mathematician on earth could figure how to save him from bankruptcy.

The market, in short, became oversupplied at the very moment the struggle ended, when war demands stopped, and when the stores of digitalis which the old men, women, and children of central Europe had somehow found time to cut and dry in the midst of war's alarms were released. From a peak price of ninety-five cents for the imported drug in 1916—which was considerably lower than the peak reached by much less important drugs not produced in the United States, digitalis dropped to six or eight cents in 1922, and had been far below profit to anyone but the medicine manufacturer long before that, for the American foxglove farmer figured his costs at from thirty to fifty cents per pound of the dry material.

Representatives and Senators of the United States, in Congress assembled, were not unmindful of the plight of the men who had seen the country through its war-scarcity. With all the solemnity of a life-guard throwing a spool of thread (without retaining an end) to a man drowned the week before, they passed in the Tariff Act of 1922 an *ad valorem* duty of 25 per cent, which had the practical effect of raising the importer's eight-cent digitalis to ten cents, but benefited the thirty-five cent farmer not at all.

The result can be imagined. Only here and there survives a small producer, who has won a quality-market independent of price. Farmer Brown, however, prefers to devote his sixty acres to winter wheat, pineapples, horse-radish, or silver foxes rather than foxglove, and thus avoids competition in a very limited market almost monopolized by the old men, women, and children of central Europe, working, if not as cheaply as before the war, still for a few cents a day.

But even so, the farmer fared better than the cat.

Perhaps, in a future international emergency—which may Heaven and the Kellogg Treaty forbid—we may call on the Pacific Northwest to supply our need of foxglove. For here is almost, if not quite, the only place in the United States where the European plant has become fully naturalized. Fortunately neither radio nor movietone has yet broadcast the expressions of the Oregon stockman who has found a new and pernicious weed taking possession of his grazing lands. In the genial climate of the Pacific slope, the foxglove attains a flowering height of—

But let us omit that. You would not believe it anyway, and it has not yet rivaled the Bigtrees of California.

The chattering, brilliantly colored toucan, portrayed by Alfred O. Gross, and another tropical story from Tom Gill's facile pen, will specially feature the November issue. Charles Fitzhugh Talman tells the story of avalanches; Paul Bartsch, under-sea man extraordinary, is biographized by Miss Chesnut, and W. Howard Forsythe makes dramatic the deeds of the thoroughbreds on track and in field. Marjorie Shanafelt and Ida Mellen offer the antics of their pets, a magpie and a collection of jerboas respectively, and it is hard to say that they are less interesting than the saurians of the Southwest Charles M. Bogert describes. Charles Pratt will discuss regeneration in insects.

A STRATEGIC ROOSTING PLACE
These Kavirondo, or crowned cranes, survey the surroundings from their perch atop a mimosa tree

WITH AFRICA'S FEATHERED LEGIONS

BY WALTER J. WILWERDING

ILLUSTRATED BY THE AUTHOR

FROM the accounts of most men who have invaded the Continent of Africa, it would seem that it is a land inhabited principally by lions, rhinoceroses, elephants and buffalos. These are the magnets that draw the adventurers and so-called "big game hunters" who are everlastingly telling us about these animals and their own exploits. Few of them mention the multitude of birds that make their permanent homes there, or the other great numbers that migrate to Africa during the European winter.

So when I went to Africa it was to study the birds as well as the mammals. I camped on the shores of Lake Bassotu, in Central Tanganyika, East Africa. No location could have been more ideal. The lake was the rendezvous for about every hoofed, horned, and carnivorous animal in that section. Its depths were the refuge of six large hippopotami and one little fellow. But chiefly it was the gathering place for feathered folk, and early morning and evening found the shores a veritable congress of bird life.

Our largest bird neighbors were the ostriches; there were always some of these feeding near the camp. I never saw one drink, but think they went to water early in the morning or soon after dark. At any rate they were always near my camp right after sunrise and just before sunset.

With his contrasting black and white plumage, a cock ostrich is the most conspicuous object on the African veldt. Incidentally, they are far from extinct. Wherever I went I saw ostriches; often in flocks of from twenty to thirty birds. They walk about with the head down when grazing, but are instantly on the alert when man approaches. I found no animals on the veldt as wary as the ostrich. The moment they sight you they are off with that high-stepping run of theirs—with head and tail held high—and, into the bargain, they stampede everything in sight.

Near the lake there were storks, herons, cranes, spoonbills and other wading and shore birds, as well as ducks, geese, grebes and pelicans. One flock of Egyptian geese came to the lake regularly every morning at about nine o'clock and I was usually on hand to greet them.

Of the storks, the jabiru was the most colorful. Their conspicuous black and white plumage and red, yellow and black bills added an exotic touch to the scene. The marabou storks were usually walking along in the shallows in single file and seemed to be in perpetual contemplation of some serious subject.

Another large wading bird that always attended the bird congress was the pink wood-ibis. This species is as large as the common European stork and has pinkish tinted feathers. It is especially colorful under the wings, where the wing-linings look as if they had been dipped in purple.

The pelicans seemed to do their feeding in the dark, as they were always clamoring at night and spent their days resting in a solid mass on shore or busily engaged in airplane tactics in the air. Often while I was sketching in the heat of the day, I would hear a faint, whirring sound overhead, and looking up, would see the pelicans maneuvering about. They seemed to be soaring for the pure fun of the thing and always provided a show worth watching. At times the white spoonbills would join them, and there was usually a fish eagle soaring high above them. One evening a flock of flamingoes also joined the air circus, changing swiftly from wedge formation to single file, and if Nature ever puts on a better show I have failed to see it.

THE BARE-FACED TURAKOO

A large gray bird forever walking about in the acacias

Sand grouse were also regular visitors at the lake. They look much like ptarmigan and are various beautiful shades of gray, tan and rich reddish brown. The females are spangled with gold and slate gray. They congregate in large flocks on the open veldt in the day-time and come to water regularly at sunrise and sunset.

One of the memories of Africa I shall always carry is the "eh-ah-ah" cry of the sand grouse. Wherever one goes a flock of them rises before you, and away they go on swift-moving, pointed wings, looking like flocks of pigeons. You can always distinguish them without looking because of their incessant gutteral call of "eh-ah-ah", "eh-ah-ah".

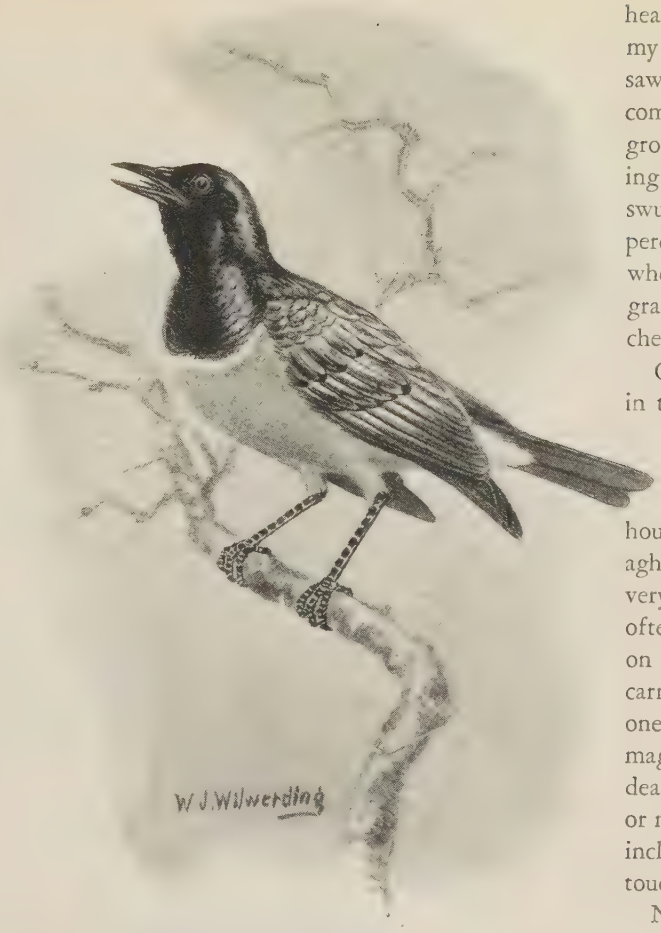
Conspicuous birds of the evening were the bare-throated francolin; called "qualla" by my black boys. They have a bare patch on the side of the face and another on the throat, and are much like large quail in size and habits. In the evening the veldt rings with their calls as they come out of the high grass to go to their roosts. They stop at the edge of the grass and call "more-rain, more-rain" and then run, as if pursued, across open places to the cover of the trees. I caught a beautiful male and put it in a box, intending to make some color studies of it, but, in my absence from camp, my black boys became consumed with curiosity and took a peep at the "qualla". Result—no bird.

Our most numerous residents were, however, the guinea-fowl. These look exactly like our common barnyard variety and are always plentiful near water. One peculiar thing I noted about them was their habit of going to and from water with the herds of wildebeests. The wildebeests would go charging along, kicking up their heels and raising the dust, with the guinea-fowl running as hard as they could to keep up with them. They were ever calling stridently as if telling the wildebeests to wait for them and not hurry so much.

A PAIR OF FISHING EAGLES

These birds, as well as the tawny eagles, seemed always to appear in twos

One evening I noticed great flocks of guinea-fowl gathering on an open stretch of grass. Hillsides, woods and thorn-bushes were all giving up their quota, until it seemed that all the guinea-fowl in the world were coming to a grand conclave. Soon the veldt was black with them and I wondered what it was all about, when, of a sudden, one flock after another took wing and flew to the tops of the acacia trees, until the slender top branches were bent with their weight. As I started back for camp one of my boys asked me to shoot some of them for him. I told him that white men did not shoot roosting birds. He smiled and looked wonderingly at me, and I suppose he thinks that this is one of the white man's superstitions.



ORANGE-BREASTED GLOSSY STARLING
The bird that takes the prize for beauty with its coat of violet, blue and deep green

Birds of prey also made Lake Bassotu their rendezvous. Through the heat of the day flocks of vultures sat in the shade of the acacias on shore, often with wings spread out for an airing, which they doubtless needed. The eagles, of which we had both the fish and tawny varieties, always came about in pairs. One can never fail to know when fish eagles are about. Their scientific name is *Haliaetus vocifer* and they certainly live up to the last part of it. Whether perched on a rock or soaring high overhead, they are continually screaming "Who-wee, wee, wee, wee!" They remind one of our bald eagle with their white heads and tails. At close range one sees that they are a beautiful dark red-brown on the body.

One day I was seated in the shade of a thorn-tree, making a sketch of some grouse, which were shot for the table, when I heard a rush of wings over my head. Looking up, I saw a tawny eagle that had come down to pick the grouse off the table. Noting my movement, he swung upward again and perched in a mimosa tree, where he looked very grand on the twisted, lichen-covered branch.

Often, while I sketched in the shade of a mimosa, a white-necked raven would perch above me and revile me by the hour. His incessant "Krr-agh-krr, krr-ah" became very monotonous and I was often tempted to use a gun on him. This raven is a carrion feeder and is the one living thing, besides a maggot, that will eat a dead hyena. No other bird or mammal that I know of, including the hyena, will touch one.

Near the lake, the acacia groves were fairly alive with small birds of every description and here some strange call often lured me on to find the author of it. Once I heard a "klunk-klung" that sounded as if someone were pounding an anvil. I hunted for the creator of that sound in vain. The call seemed to have no definite location. Day after day the evasive "klunk-klung", but where was the bird? Then one day I happened to be

A SEDATE TRIO OF AFRICAN MARABOU STORKS
Wading about in shallow water, these fellows seemed always in contemplation of some serious subject

watching a family of mongoose at their hunting in the grass, when the sound came directly from my right and I soon spotted the songster. It proved to be a bird about the size of our catbird, but a bit plumper and of a darker bluish-gray color. One who knows the African birds well tells me that it is undoubtedly the black bush-shrike, whose common name among white settlers is "anvil bird".

Strangest of all were the calls of birds that sounded like those of our American feathered friends. There was the bird that called "whip-poor-will" and did not even faintly resemble our bird of that name. Again and again I heard a "jay, jay" from across a glade, but oftenest I heard the "mee-ow" of our catbird. I soon located the caller. It was an oriole, about the size of the Baltimore oriole, with a bright yellow body, black head and throat, black and white wings, pink bill and red eyes.

Once when walking through the woods I heard a loud "hoo-uh!" from high up in an acacia, followed by a chattering sound. Looking up I saw two large gray birds, with crests and long tails, climbing about in the upper branches in the manner of parrots. These were the bare-faced turakoos and I often saw pairs of them after that. They were forever walking, instead of hopping, from limb to limb of the acacias; twisting and turning, so that they were as often upside down as rightside up.

THE ORIOLE OF AFRICA
It has the "mee-ow" of the catbird and is the size of the Baltimore oriole

I lived in a native hut, built by the Wairamba, and directly before the door there was a huge mimosa tree in which a colony of weaver birds had suspended their nests—like so many miniature hay-stacks—from the branches. Each morning they left the nests at sunrise and their twittering proved quite an effective alarm clock. At night they were back again to their nests, which were used as sleeping chambers.

When everything is new, each focus of the binoculars toward a movement in the trees is an adventure. One day they brought to view a pair of pretty, green parrots, with orange heads and red bills, about the size of an English sparrow. They were not the parrakeet type, with small bills and long tails, but had the proportions of the larger parrots. In want of a name for them they are called "love-birds" by Europeans, but to those with scientific inclinations the name is *Agapornis fischeri*. They may have been quite numerous, but on account of their coloring were hard to locate in the green foliage. Thousands of them are captured and sent to Europe as cage-birds. I saw many of them ready for shipment in Dar-es-salaam and further numbers in the bird markets of Paris.

The beauty prize must, however, go to the glossy starlings. These are also about the size of a Baltimore oriole and have orange breasts, with the head, back, wings and tail glossy violet, blue and deep blue-green. They look for all the world as if they were dressed in satin coats, and they carry the fitting scientific name of *Spreo superbus*. They have good voices as well as beauty of feathers and the sweetness of their songs makes one feel that spring is in the offing. Their usual song is a call of three notes that can best be described as "who-wee-hur", but they also imitate other birds and their serenades are one of my pleasant memories of Africa.

Some hundreds of miles south of my camp, where the water-holes were but small ponds in a thorn-bush wilderness, the bird-life was more concentrated and these ponds were often loaded to capacity with many varieties of water birds. Near one such water-hole I saw a flock of six kavirondo, or crowned cranes, standing on the flat top of a mimosa tree, where they formed a beautiful and typically African decoration.

One of the last memories that I carried from East Africa was that of a bulbul pouring out his song from a cedar in front of the balcony of my room at the East African hotel in Dar-es-salaam. Here I spent a few last, lazy days before sailing for North Africa and the bulbul proved pleasant company as I loafed in range of his music.

HELMETED GUINEA FOWL AND WHITE-BEARDED WILDEBEESTS

These common birds seem to enjoy coming down to the streams to drink with the mammals

From North Africa I have added memories of flocks of little white egrets, or cow herons, standing in long rows in irrigation ditches along the Nile, and the chorus of bird-calls from the trees that line the streets of Cairo. These last made such a din in the evening that they almost drowned the street noises.

Surely there is no dearth of feathered inhabitants in Africa and it is unfortunate that few travelers to this wonderful continent take the trouble to tell us anything about them. So little in fact have they paid attention to them that the smaller birds are often distinguished by their scientific names alone, as they have no English names.

I tried to find out from my black boys what the different birds were called in the Swahili tongue, but to the natives these small birds are all only "Ndege", which translated into English means "bird" and that is all.

JOE CRANSTOUN JONES passed quietly away in Augusta, Georgia, on August eleventh. The scissors with which his deft fingers fashioned the world of the wild in silhouette lie folded. The unquenchable spirit of this boy, bound to his bed and his chair, denied the fields and the forests, the birds and the animals that he loved, cannot have died. It has merely passed along to a sweeter and a gentler world. The indomitable courage he had to lift himself and his genius above the millstone of his crippled body lives after him. It, and the all too few instances of his unique art, remain to us as an inspiration to climb over the lesser boulders we may find in our own less difficult paths.

We are happy to have been able through our pages to present some few of the charming products of Joe Jones' genius; to have told the story of his courageous life in our pages. We are sad to have to record his passing from among us, but we know that Joe Jones has gone from us to a place where his handicaps and his sufferings in this imperfect world are forgotten and his courage will be rewarded. We like to feel that he is travelling, as is the Indian in his silhouette, over quiet waters to a lovely land.

JUST A BOWFUL OF GUINEA PIG
Bopo seems very contented without taking to the pipe

BOPO THE BOLD

THE ANTICS OF A PET ABYSSINIAN CAVY

BY RHEA KIMBERLEY JOHNSON

PHOTOGRAPHS BY THE AUTHOR

THE curator of a large zoo once made the statement, in print, that guinea pigs were stupid. Now guinea pigs raised in a zoo for the sole purpose of feeding large snakes and guinea pigs raised as pets are two different things. Animals are like children; the more love and attention they receive the more their intelligence and individuality is expressed. Our family has owned five guinea pigs at various times and I am ready to bear witness to the fact that they have shown a marked degree of intelligence.

All guinea pigs are cavies. They are natives of South America. There they exist in some form almost everywhere, and some kinds are hunted as game. As these little rodents live entirely on vegetables and grain, or food stuffs made from grain such as crackers and bread, no doubt they would be good eating as to quality but very small as to quantity.

There are several species of cavies. The short-haired is the most common. The long-haired is called the angora cavy. The least known in this country is for some reason called the Abyssinian cavy. He, too, has long hair but it is as mussed up as though a strong wind were blowing it in several directions in a sort of permanent wave.

We have an Abyssinian cavy as a family pet. Bopo is his name. His reddish-brown hair grows in swirls all over his body for all the world as if the proverbial cow had done a good job of licking him. When he hunches up into a little furry ball it is difficult to tell whether he is headed north or south.

Bopo when very tiny was given to the youngest member of the family as a birthday gift. Thus he has known human companionship nearly all his life and knows no fear. He will follow his young master about the lawn like a dog. He will cuddle up against any one who holds him and lick the hand that strokes him while he sings his little, happy song.

He always sings this song if he is contented and some one pets him, for the same reason that a cat purrs, to express pleasure. It would be difficult to describe the sound on paper. One old gentleman I know says it sounds like a loud cricket.

Bopo has several oral ways of expressing himself. When he wishes to attract attention or call some one he whistles very loudly. When he hears a strange noise or is

JUST OUT FOR A JOYRIDE IN THE PLAYROOM DUMP TRUCK
The guinea pig is the cargo and the toy dog the driver, and they are out to see the world

alarmed he makes a noise in his throat which sounds like a deep trill. When begging for food he modifies his whistle to a soft, coaxing sound. When angry he simply grinds his teeth and tries to look fierce.

He has no fear of Janus, the family Airedale. When put on the floor near him he will run to the dog, snuggle against his broad chest and sing contentedly. Janus, who never molests a pet belonging to the family be it guinea pig, rabbitt, chicken or white mouse, accepts this mark of attention benevolently.

A box, from which the top and bottom have been removed, and over which a piece of wire has been securely fastened so that no prowling animals may get him, is Bopo's out-door home. Several times a day the bottomless box is moved to a fresh place on the lawn so that he may have fresh grass.

As we live in a wild, mountainous place, where foxes, skunks and even bobcats still exist, it would be unsafe for Bopo to stay out all night. He is brought in at night and put in the kitchen in a large grocery box which is daily lined with clean newspapers. As cold weather approaches he must stay in most of the time. These little rodents cannot stand extreme cold.

He loves to stretch up as far as he can—it is amazing how long he can make his fat, little self—and peek over the side of his box. From this vantage point he can watch his human friends.

Bopo will eat nearly any kind of green vegetables and anything in the shape of grain or bread and crackers. Water he utterly disdains. If a guinea pig has plenty of green stuff, such as lettuce and grass, he will not touch water.

His favorite food is the humble carrot. If he could talk in human language I'm sure he would call me "The Carrot Lady" because I always keep a supply of carrots on hand for him. The little rascal knows that they are kept in the store room, directly off the kitchen and as soon as he hears the store room door close he starts to whistle loudly. If one closed that particular door forty times a day he would demand carrots each time.

He also knows the sound of the tin bread box. The minute he hears the rattle of that bread box he calls loudly for bread.

Bopo is only rivaled in intelligence by Willie, another cavy owned by our family. Willie was house broken and allowed to roam about at will down stairs. If we went away from home upon returning we always called, "Willie, Willie where are you?" The cunning creature would whistle and come running out to meet us.

INVESTIGATING THE FOOD SITUATION
Bopo prefers carrots, however, to anything in the world, and will call loudly for them

Willie had one accomplishment that Bopo has not learned. He would sit up on his haunches and beg for food like a dog. A very difficult achievement for a cavy with the type of rolly-polly anatomy he possesses.

Willie had one bad trick. He loved to chew the covers of some books which were on a low book shelf within his reach. He never offered to lunch on these books if any one was in the room after he had once been slapped for it. When I heard him start to chew I'd call from the next room, "Willie, get away from those books!" He'd scamper away as fast as he could.

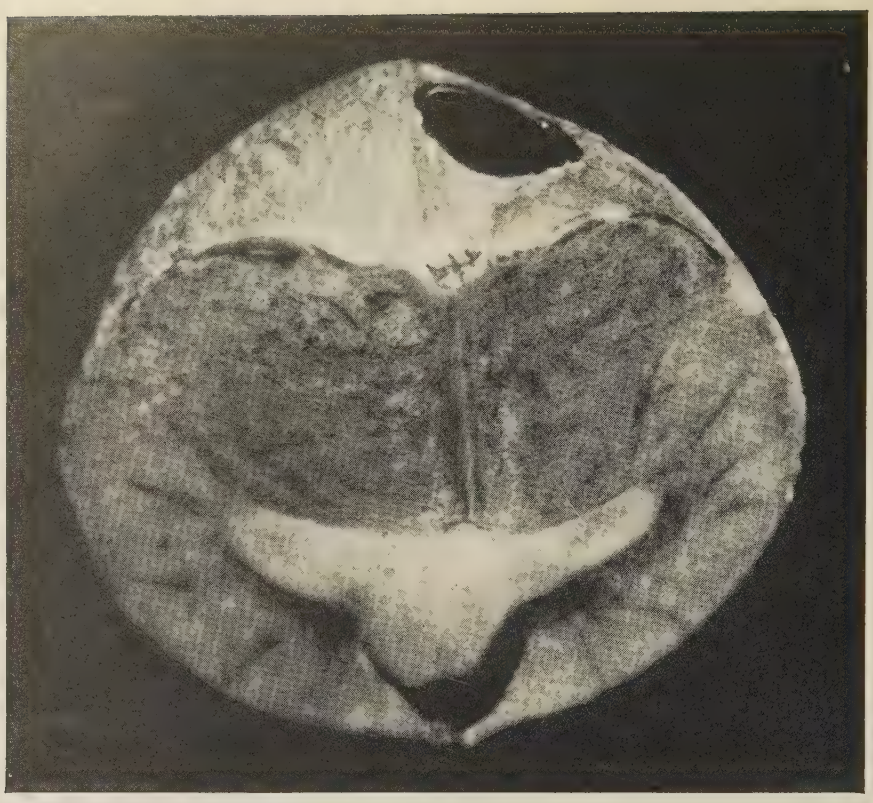
He had a little box in the kitchen for a bed. A small Boston terrier, named Hebe, slept in a larger box in the kitchen, too. On cold, winter mornings upon coming into the kitchen, we always found Willie sharing the little terrier's bed. He had discovered that it was warmer in there with the dog.

Both Willie and Bopo were Abyssinians and showed more intelligence than the other breeds.

Cavies show their instinct to play as many other rodents do by leaping into the air and giving themselves a little shake simultaneously. Bopo often frisks—or would one call it gamboling or cavorting?—in this manner. He is a happy little fellow and enjoys life. Once only, tragedy, in the form of a strange dog with savage fangs, rushed at him. He was rescued in the nick of time by a friend. May he always be as skilfully saved from danger and be spared to live a long life; there is no doubt that his is a merry one.

AS TAME AS COULD BE
The cavy loves human association, and sings loudly when petted

A REAL JACK O'LANTERN
But look fierce though he does, the cavy really would not hurt anyone



ITS JUMPING DAYS ARE OVER

Through the circular hole in the top, the adult moth, whose larval period was spent within the shell, has made good its escape

THE JUMP IN JUMPING BEANS

BY GEORGE T. HILLMAN

A WISE little grin came over Bobbie's face when his Dad placed some ordinary looking seeds on a tin plate and said, "Now just watch and see them jump." First one, and another tilted and rolled a little, shortly a regular rata-tat-tat was being played on the plate.

"What makes 'em jump, Dad?"

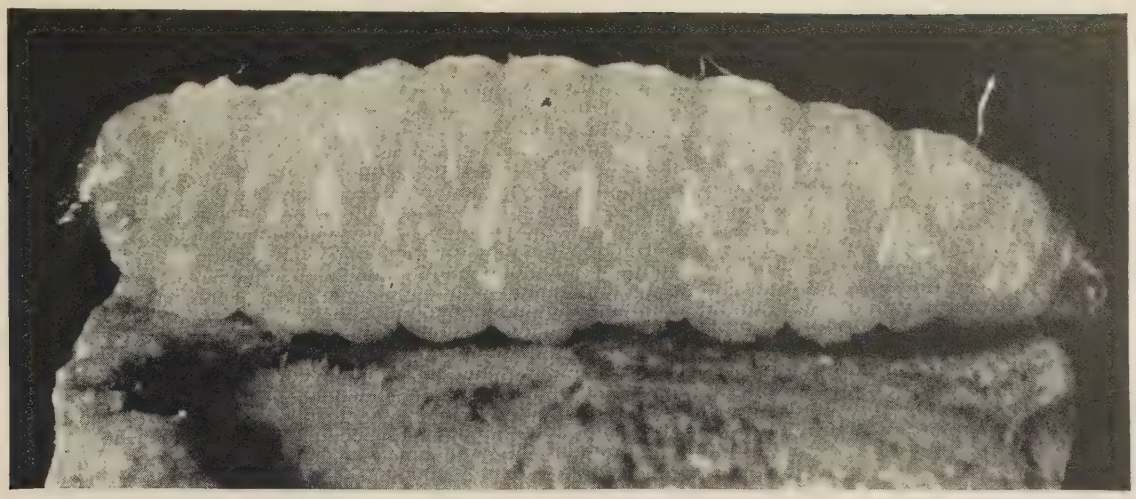
Now the question of what puts the jump in a jumping bean is quite simple, compared with others a youngster can ask, and Dad got off easily. His story opened down in Mexico. In Chihuahua there grows a spurge, family Eurphorbiaceae, whose commonly three-celled bean pod is chosen by a bean moth, *Carpocapsa saltitans,* to furnish shelter and food for its eggs and larvae.

There is no especial mystery about the Mexican jumping bean, but a large number of Nature Magazine readers have inquired for an explanation of the queer antics of an otherwise sedate seed. We are glad of this opportunity to print the history of the parasitic larva, and present the remarkable microphotographs taken by Mr. Hillman. When next you have a jumping bean, see if you can find the athletic insect within

Without the opportunity to study the habits of the adult moth and the deposit of eggs on the plant one would have to guess at details concerning just when and where the eggs are laid. The evidence at hand, however, indicates that the larval life begins inside the bean after the seed is quite mature. The egg is presumably laid in the flower or still green and tender seed pod and there develops into a larva, which, finding itself surrounded by a rich tasty meal, proceeds to eat away the interior of the bean. Apparently quite content, it remains a prisoner in this hollow shell, lining the inside with silk from the tiny spinneret located in its head.

At this point the bean becomes marketable. It is collected and shipped north, to be sold at three to eight for twenty-five cents, for the entertainment of little boys both young and old.

The larva, now being much over weight, and having nothing better to do, begins a long series of reducing exercises which are responsible for its fame. The nature of this activity was watched one day after cutting away



THE REASON FOR THE HOPPING

This beautiful opalescent larva, by snapping its body when its legs are entangled in the shell's lining, causes the mysterious movement

the side of the bean. The larva immediately began to weave a silk cover across the opening and continued until it was closed perfectly tight. This we then proceeded to cut away and immediately it spun another cover. The game was played over a third time, but this cover was quite thin so that in a strong light and with the aid of a microscope the little jumper's actions could be watched with ease.

On the rear segments of its body are two rows of four prolegs, and on the first three segments is a double row of three legs which represent the true legs to appear later in the cycle. Each of the six true legs terminates in a hook, while each of the other eight has a ring of some forty tiny catches that may be fastened at will to the silk lining of the shell.

When the front and rear rows of hooks are caught into the lining on opposite sides of the shell, a sudden contraction of the body snaps the catches loose and the

JUST ONE MORE HOME FOR RENT

Not an insect caught in a trap, but an old pupa case left by the moth. At the left is seen the circular trap door cut by the larva to be used later as an exit

THE RESULT OF THE COMMOTION

Less handsome than the larva and less interesting than its birthplace, nevertheless the adult moth is the finished product of the victimized bean

momentum causes the bean to jump. The larva weighs about as much as the shell.

The larval stage continues for several months after which preparations are made for the next stage in its life cycle. A circular opening is cut almost completely through the shell at one end leaving a round lid-like door that is closed for the time being. Such forethought is truly marvelous for the larva itself has no particular interest in the door—it is to serve as an exit for the adult moth at the end of the third or chrysalis stage, which comes about some time after the usual sort of cocoon has been woven.

So you see Bobbie's question was not so difficult. But who can explain why it jumps or how the larva learned that a door would be necessary for the final exit of the moth some months later? Bobbie, however, saved the day by failing to ask these questions.

AN INTERIOR VIEW OF THE HOME

The chrysalis, with cocoon and shell cut away. The cast off skin of the larva is at the right of the pupa

Although thousands of these beans are brought here each year apparently none of the moths have found a suitable bean growing in this country on which to deposit eggs. If they did Uncle Sam might have something to say about their being imported.

A close relative of the bean moth has fallen into the bad graces of Uncle Sam. This is no less than the codling moth or appleworm, *Carpocapsa pomonella,* that came over from Europe about 1750. This insect runs up a bill of about $12,000,000 annually for fruit alone, and it requires an additional $4,000,000 to keep him down. While apples are its main diet, the insect feeds also on pears, quinces and even on English walnuts. But so far, *Carpocapsa saltitans* has not been stirred by any such ambitions.

Another larva, *Grapholitha sebastianiae,* of the same insect family has similar habits of wriggling in the host, but has not become as well-known.

Certainly few insects are sold on the market to small boys and then found in the vest pockets of their daddies.

CAMELS FOR COMFORT IN TRAVEL
Dr. William Mann and Arvad the camel "boy"
on an expedition to Sinai in 1914

DR. WILLIAM M. MANN

AS "UNCLE SAM'S NOAH", HE HUNTS THE WHOLE WORLD THROUGH

BY ALMA CHESNUT

PRESIDING over the destinies of more than twenty-three hundred animals, gathered together from every imaginable strange corner of the world into a comparatively small city park, could never be considered an easy task. Dr. William M. Mann, director of the National Zoo in Washington, D. C., will tell you that it means much more than seeing that they are comfortably housed and fed, and that even these two routine duties can present unsuspected complications.

Animals are individual in their likes and dislikes. They form inexplicable prejudices and, like human beings, often reverse their opinions without any apparent reason. Dr. Mann, who is regarded by many of them as a personal friend, is obliged to arbitrate their quarrels, attend to matters of diet and see that they are properly cared for when they are ill. Recently he sent a tapir to Johns Hopkins Hospital, in Baltimore, for an operation, where it was cared for by a special nurse.

That the animals appreciate the director's friendly solicitude is plainly evident to the visitor who makes the rounds in his company. The chimpanzee demands water, gets it in a tin cup and gives the impression that he could drink more than his record of fourteen straight in an effort to prevent his friend from leaving. A pretty little monkey reaches out and pats Dr. Mann's hand as you would pat a baby's. From its perch in the back of a cage the penelope bird flies down to sing and dance at his bidding and the mynah from Java always has a few pertinent remarks to make in lucid English. The otter races across his compound to nuzzle against the bars to be petted, then puts on an astonishing display of water acrobatics, for all the world like a child showing off.

A bird that has caused the zoo no end of worry is the shoe-bill stork from Africa, valued at $5,000. This strange visitor is quite a pet, due principally to the problem presented by its dietetic vagaries. It refused all foods offered to it aboard ship until it finally consented to eat fresh-killed chickens. Then, after reaching the park, it went on a second hunger strike and there was a great flurry in the zoo kitchen until a new diet was found that met its approval.

Dr. Mann has found that animals who have occupied the same cages over a long period occasionally become unfriendly and, if they are of a naturally sociable disposition, it is up to him to find a new companion. For, says he, the animals must be kept happy or they will die. Contrary to popular opinion, most of them live quite contentedly in the zoo and often to a greater age than in the jungles where the keen struggle for survival soon brings death to those that have grown old, or have become ill.

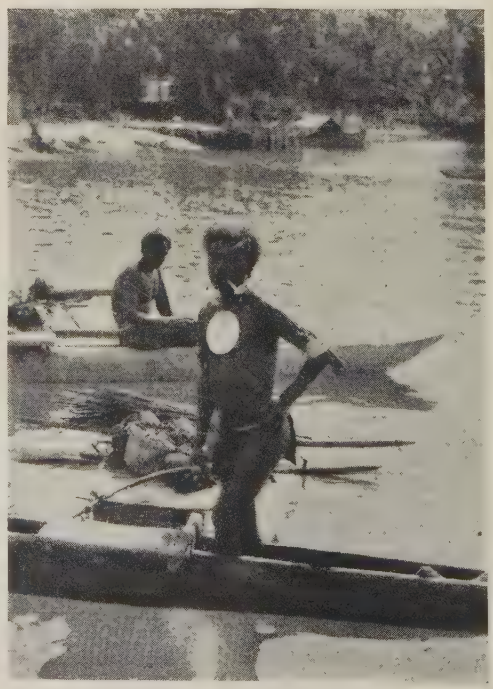
The most friendly and intelligent animals in the park, according to Dr. Mann, are the monkeys, bears and ele-

COMMISSIONER BELL AND HIS POLICE
At Auki, Malaita, Solomon Islands, visited by Dr. Mann in 1915. Bell and his force were later murdered in an uprising

CADET ALCOCK AND HIS HUGE ARMY
Fifteen years before the Kellogg pact. Dr. Mann lived with the Colonial Service officer while collecting in Fiji

phants, all of which recognize different individuals. The monkeys especially revel in human friendships and those that have been pets suffer acute loneliness.

The Barbary ape is the Peck's bad boy of the zoo. All animals, when they are young, have a keen instinct for play, but some of the monkey family never grow up. Their practical jokes are not always appreciated and occasionally they must be disciplined. The ape had a habit of making faces at his visitors and, when he had succeeded in attracting attention, hurled rocks at them. Dr. Mann ordered a screen to be erected. Then the ape resorted to his water pan, picking it up and dashing the contents at the "company". A cement basin was finally installed, but that did not prevent him from dipping up handfuls of water to throw. Another monkey would loll indolently in its cage, an arm dangling through the bars, feigning sleep. He had a passion for canes and umbrellas, which he would grab with a lightning gesture from unsuspecting guests, and once had a collection of more than sixty.



SANTA CRUZ RECEPTION COMMITTEE
The natives carried arrows tipped with human bone, and were skilful collectors of natural history specimens

Dr. Mann was appointed director of the National Zoo in 1925 and at that time the collection consisted of about sixteen hundred animals. During the Smithsonian-Chrysler Expedition in 1926, he collected a total of approximately seventeen hundred specimens in East Africa, more than doubling the zoo population. The consignment was the largest that has ever crossed the ocean at one time.

As leader of this expedition, Dr. Mann was accompanied by four white companions, three sultans, and an army of about five hundred natives who served as packers, hunters, runners, mechanics and cooks. Camp was pitched at Maji-Motu, on the edge of the jungle, and from this focal point reconnoitering parties went forth daily to gather in the prey. Some of the larger animals, including five magnificent yellow and black leopards, were taken in portable zoo cages ingeniously adapted to serve as traps and did not have to be moved out of their prisons during the entire trip. One leopard was a goat-eater that had worried the villagers considerably by making off with domestic animals and, perhaps, an occasional black baby. His capture was celebrated by a wild native dance.

Dr. Mann is greatly loved by Washington children and while he was on safari dictionaries were being thumbed and small heads cudgeled to find a suitable name for the giraffe he had promised to bring back with him. Giraffes being rare and extremely delicate, the naturalist had difficulty fulfilling his pledge. The first got away and the second died shortly after the children had cabled to inquire whether they should concentrate on boys' or girls' names. It was not until the expedition was ready to sail that two other animals were purchased from the Sudan Government.

Dr. Mann does not believe in killing unnecessarily and his natives were under orders not to shoot unless attacked. Many creatures were collected in drives. The natives would form a circle and gradually close in, beating the brush and driving the animals into nets. Sometimes they were run down into a lake and taken in the water. None were sacrificed except for food and among the

valuable and interesting creatures brought back to the zoo were a large antelope, called a kudu, a duiker, which is an antelope no larger than a small dog, reed bucks, impallas, elephant shrews, a mynah, or talking blackbird, dikdiks, the smallest antelopes in the world that are no bigger than cats, and a rare monkey which the natives call *Akilizote,* "the one who knows everything".

Years previous to his expedition into Africa, Dr. Mann had formed globe-trotting habits. There is hardly a country, civilized or savage, that he has not visited and often his travels have taken him into little known and dangerous territory. Upon numerous occasions he has risked his neck in the interest of natural science, though you would have a difficult time making him admit it.

CORAL ISLANDS AT TULAGA, FIJI

Among hundreds of such islets, washed away at the base by the South Seas, Dr. Mann spent four months in a native cutter in search of new specimens

He was born in Helena, Montana, July 1, 1886, where he first attended public school. He had, he says, a peripatetic education. After finishing his elementary work at a private school in Spokane, Washington, he was sent to Staunton Military Academy in Virginia, where he completed his college preparatory course in 1904. He studied for a while at State College, Pullman, Washington, but spent 1905 and 1906 working in Texas. In 1907 he worked in Helena, Montana. His earnings helped pay his college expenses. Later he won his B. A. degree at Leland Stanford University and qualified as a Doctor of Science at Harvard.

Always devoted to animals, Dr. Mann secured his first job at the Washington Zoo when he was sixteen years old. Some of the buildings at Staunton had burned down and young Bill, delighting, we fear, in the bright interlude thus provided, came up to the Capital, applied for work and got it. He spent happy days hauling water to the animals and sweeping out their cages.

As a naturalist, however, his earliest activities centered about insects. He collected them as a small boy and it was as an entomologist that he made his first bid to fame. His consuming interest has always been ants so that, no matter what duties were assigned him on his various expeditions, he always had one eye open for new species. In testimony of his prowess as an ant hunter, a list of more than four hundred new species stands to his credit.

There was, for instance, the ant called *Emeryella schmitti,* which had been described by a German scientist in 1901 but had not been reported since. Dr. Mann spent months in quest of this species, indulging in so much enthusiastic chatter about it that it came to pass that the ant was known familiarly to his friends as "Mary Ella Schmitt". To his delight and their relief, he finally located "Mary Ella" under a certain log in Haiti. But perhaps we digress.

"TWO RUINS IN MOAB, 1914"

Such a title does Dr. Mann, the "ruin" in the foreground, give this picture, showing Roman ruins on the Syro-Arabian plateau

Though his first expeditions were in search of insects, Dr. Mann has always collected animals, too, and has discovered a number of new species, including frogs, a snake, a toad, lizards, a scaly-tailed rat, a jumping hare and a new bird. As a sophomore at Stanford he went into Arizona and New Mexico and in 1910-1911 visited Brazil as entomologist on the Stanford Expedition led by Dr. John Casper Branner, the great authority on that region. From Brazil he brought back, on the side, several monkeys which he presented to the New York Zoo. In 1913 he visited Mexico for the first time and the next

year found him following the old Mosaic trail through the Near East with the naturalist John Phillips.

At Harvard, in 1915, he won the Sheldon Traveling Fellowship, entitling him to two years of European travel. Europe then being in no condition for sight-seeing, he was permitted to go instead to the South Seas where he hunted insects to his heart's delight in Australia, as well as in the Fiji and Solomon Islands.

Upon his return to this country he accepted a position with the United States Bureau of Entomology. Since by this time he was a confirmed nomad, it was stipulated that he should spend one half of his time in research and the rest in foreign travel. Assigned to conduct natural history surveys in different regions, he journeyed extensively during the next eight or nine years and was to be addressed, at various times, in Cuba, the Bahamas, Mexico, Honduras, Guatemala, Colombia, Panama, Brazil, Spain, Portugal and Italy. On these expeditions he was assigned definite pests to study, but he never forgot his favorite hobby and Saturdays and Sundays were always "Ant Days".

Many readers of *White Waters and Black,* Gordon McCreagh's entertaining record of the Mulford Expedition (1921-1922) to the little known upper Amazon region of Brazil and Bolivia, must have tried to guess the identity of the "Bug Hunter" to whom the book is dedicated and who figures so conspicuously in the narrative; but those who know Dr. Mann had no difficulty in recognizing him in the author's graphic description of the eminent entomologist who "with the indefatigable patience of a bear turns over stones by the wayside and rips bark off trees, looking forever for microscopic bugs which he may pick up with fine tweezers and drop into an array of carefully labeled bottles of alcohol". Mr. McCreagh might have added that the "eminent entomologist" also collected one hundred and thirty-five animals which he brought back alive for the National Zoo.

Dr. Mann is a gentle, kindly person, of dark complexion and medium height. When he talks he looks directly at you so that you understand instinctively why children and animals like him. He is well-poised, modest and fearless. In short, he is the sort of naturalist who can go on calmly collecting ants in the middle of a revolution. Various government officials, asked to look out for him in desolate parts of the globe, have found this no easy task. Commissioner Bell took him under his wing in the Solomon Islands, the most dangerous of the South Sea group, where there is always the danger of a native uprising. He insisted upon an escort of two soldiers for collecting near the edge of the compound, four on the border and twelve in the interior of the island. The naturalist thought such precautions ridiculous but had to put up with them. Last year he was shocked to learn that his friend had been murdered by savages.

Dr. Mann has been safely through two revolutions in Mexico. In 1924 he got caught in rebel territory and was tied up for a month at Manzanillo, in the company of a traveling salesman or two, until a federal gun-boat towed him to a steamer at anchor, which brought him back to San Francisco. Interviewed by reporters, he said that he had been very bored; that he had been prevented from going where he wanted to, and that he had simply eaten three meals a day and spent the rest of the time collecting insects. Once Dr. Mann followed a narrow mountain trail in wilderness country, only to find it end in an abrupt drop of a thousand feet into an angry torrent. He has fought tropical fever in Guatemala, the Solomon Islands and Brazil. Crossing the Syro-Arabian Plateau, his caravan was attacked by Arabs and a boy was killed, but Dr. Mann was only slightly inconvenienced because he "happened to be three miles away eating lunch."

The microphone is Dr. Mann's pet aversion and his newest hobby is the reptile house that went under construction in the park last January. During a whirlwind trip through Europe last summer he inspected twenty zoos in sixty days, gathering ideas for reptilian comfort, and came back with enough suggestions to keep eleven architects busy. The glass compartments for the reptiles are electrically heated and the entire building measures one hundred and ninety-five by eighty-five feet. There is a frog and toad compartment at one end and a crocodile lake at the other.

But reptile houses or no, the ants still retain their place of importance. Tuesday is "Ant Day" at the zoo and on this day Dr. Mann identifies specimens sent him by the National Museum and Bureau of Entomology, delightedly thumbing his books and notes, and answers letters containing queries and suggestions. He contemplates arranging an ant village at the zoo, so that visitors can actually see how these are constructed and managed.

In spite of his colorful career, Dr. Mann will tell you with a perfectly straight face that he has never had an adventure for he persists in the notion that "when you have a real adventure you get killed". One of the most exciting times, he says, that he ever had was when he transferred three porcupines "from a small smelly cage of which they were extremely fond to a large airy box into which they did not care to go".

The biggest thrill to Bill Mann still consists of finding a new ant and, in spite of the fact that he took unto himself a bride in 1927, Dr. Mann still wears "the most disreputable hat in North and South America".

The Editors are now at work on the Texas Number of Nature Magazine to appear in December. Mr. Jex has done another of his fascinating covers for this issue and some fine articles have been acquired. As with other special numbers subscribers may have four copies sent to any four addresses (or multiples of four) by placing an order in advance accompanied by one dollar. This is necessary in order that the extra run may be provided for.

PHILIBERT, THE SILVER-GRAY

A SQUIRREL WHO WAS EVER AN OUTLAW

BY BEN HUR LAMPMAN

ILLUSTRATED BY R. BRUCE HORSFALL

ONCE we had a squirrel. I find, after these years, that it is with mingled sentiments of regret and satisfaction I am enabled to write it so, in the past tense, with bygones as bygones, and only memory to attend me. Yet I trust that in the wide exterior world to which he fled perforce, a world of purple canyons and massive sugar pines, he has come to no scath; that no hawk has stooped to his death, no illness or infirmity overtaken him, nor any of the ten thousand jeopardies quelled that bold and trenchant spirit. For, as I say, though all is over between us, I would not have it otherwise than well with the squirrel that once was mine.

Frankie, the blacksmith's boy, came of a morning to the porch where wistaria was, and called me from my book. There was that in his hands which quickened my feet and gave me instant gladness. A glorious color, an elfin semblance, with wise and dancing eyes, and such a plume as one might wear to the wars. The little old man of the forest, the gayest, most volatile and yet most provident of all creatures from the mountains to the sea. Who has seen that plume drooping among green fronds, and marked the litter where cones have been stripped, and heard the sharp challenge of the hidden sentry—well, he is certain to have a feeling for squirrels, a sort of fondness. And Frankie grinned at me and held the captive forth.

"They been telling me," said Frankie, "that you wanted a squirrel, and so I brung him."

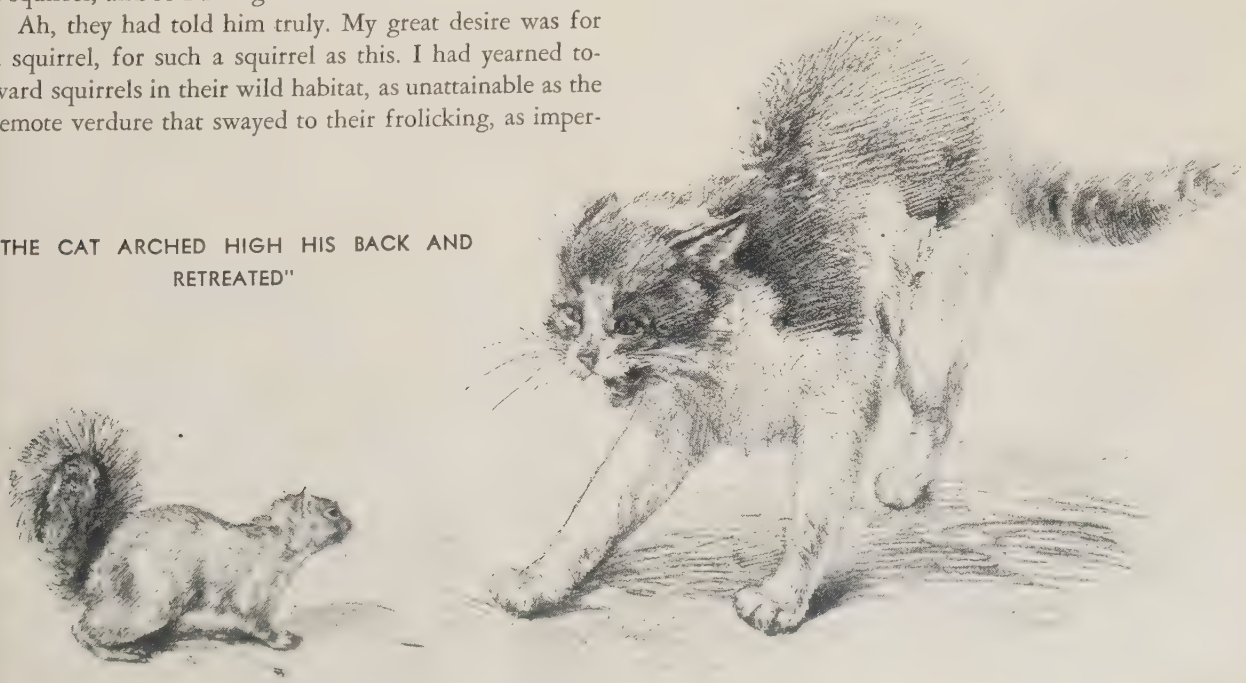
Ah, they had told him truly. My great desire was for a squirrel, for such a squirrel as this. I had yearned toward squirrels in their wild habitat, as unattainable as the remote verdure that swayed to their frolicking, as impermanent as a dream. My wish was fixed upon a squirrel that, so my indulgent friends had told me, would follow me as the smallest of dogs follows his master. I had longed, as many must have longed in like case, for the intimate privilege of possessing that charming wildness, of smoothing its pelage with my own two hands, of ministering to it, and of proving worthy of its confidence and esteem. And at long last my hands closed above the rapid, captive heart. 'Twixt faith and desire I had my wish.

"He ought to be worth a dollar an' a quarter," ventured Frankie brightly. "'At's a good squirrel."

"Do you think he'll learn to like me?" was my eager, anxious question.

"Why, sure," said Frankie. "Mister, he likes you fine a'ready."

So coins were passed and the squirrel was mine. He was a silver-gray, in his first year; of the magnificent superspecies common to the Pacific west, and which attains its most luxuriant growth and adornment along the reaches of the upper Rogue, in valley and mountains alike. That pattering pulse beneath my fingers, that small cool nose thrust deeply into a palm, the dark eye regarding me, the beauty of the grayness that is like to naught else, and the true argent gleam. Mine for a handful of small coins! Mine, if wiseacre friends spoke of knowledge, to follow me like a dog. And I beheld, as you must surely know,



"THE CAT ARCHED HIGH HIS BACK AND RETREATED"

the companionable days ahead. My silver-gray!

Well, there was the carpenter man to summon—an amiable ancient, skilled in the working of woods—of whom it was often said that a career might have been his had he turned to cabinet making in his youth. To such a one, who wrought harmonies in sleek, grained fir, the project could safely be entrusted. The carpenter man bent his gray beard above the gray squirrel, and poked the captive gently with a brown, spatulate finger. He said that it was an extraordinarily discreet and valuable creature, as docile as heart might hope for, and that in all his extensive experience with squirrels, gleaned through a long life and over a broad continent, he never had seen its peer. My confidence in his cunning as a carpenter, he observed, would be amply requited, and for this prince of squirrels he would create a palace at most moderate cost.

"Look at 'im," chuckled the carpenter man. The yearling scion of a noble race actually was opening a nut! Moreover it was evident that never since squirrels made inquiry of nuts had any squirrel gnawed so ably, with such superior craftsmanship, or indulged himself in pauses of such remarkable solemnity and erudition. Thereupon the carpenter man fell zealously to work.

Not the stripling of Cathay when he had rubbed the lamp had a domicile more splendid, I'll warrant you, speaking relatively, you understand. Elegant and commodious, furnished neither too much nor too little, gabled and screened and stained—a house of houses, for the squirrel of squirrels. There was a bed chamber, amply provided with the best excelsior the grocer could furnish; and a really tremendous gymnasium, fashioned in the popular cylinder style, of quite the finest fly-screen, whirring as smoothly as an angler's reel; and a drinking fount artfully placed; and sand on the floor; and a miniature tree of seven bare branches—and, well, just about everything a distinctive establishment for the bachelor squirrel should have. I positively knew he would be happy there. No expense had been spared. The carpenter man, who might have been a cabinet maker, had wrought his dream in wood. As we used to say in those parts, the completed dwelling—oh, most inadequate noun—"stood me around seven dollars."

"Philibert," said I to my squirrel, "come and be happy!"

I had named him Philibert, and in fancy had spelled it so for the identical reason, whatever it may be, that maidens give themselves when they be-letter and enhance the crude cognomens of baptism, with a "y" here, or a "w" there. And, besides, it was classic. So I drew Philibert, with some reluctance on his part, yet without premonition on mine, from the battered canary-cage that had been his temporary abode. I placed the silver grayness of him on the sanded floor of the carpenter man's creation.

Regard this squirrel of mine, who aforetime was moody, almost to sorrow. How, with but a few tentative prowlings and sniffings, he ascertains the mansion to be in all things well appointed, spacious, desirable and convenient. How he wafts from limb to limb of the seven-branched tree, pretending that he at length has regained the natal sugar-pine. The chortlings of delight, how they escape him. How he ventures a nose at the prim entrance of the bedchamber, and presently follows his whiskers, leaving naught save a tuft of tail to attest that he has taken possession. How he pops out again, with a playful bound, and squats on his haunches to consider the gymnasium. How he enters it to discover that it sways enchantingly beneath his daring feet. How he bounds to elude this strangeness and on the instant is racing bravely against time and space, without gaining so much as a twig's width. The pause. The flashing, glancing spring that wins free of the wheel. How he then reflects, and is emboldened to put all to the test. The joy and lightness of it, going around and around, to the drone of the shaft, without ever arriving. It was disport that never grew irksome to him, and, too, it strengthened and toned those small, lithe muscles. And, also, it was so amusingly human. Yes, Philibert soon learned to love his home.

"Phil!" I would call, when he was not to be seen, not anywhere.

The nose would appear at the doorway of his chamber. The trim, fine head would follow, the fluent, somewhat portly body, and the magnificence of his stately plume. The roof of this chamber was fashioned as the cover to a chest. It had a handle, thoughtfully provided by the gifted carpenter man. You had but to lift the roof ever so lightly, so warily, to come upon Phil at his slumber. He had gathered the cotton we gave him, to the last wisp, and borne it bedward, and with it had robbed the excelsior of all harshness. There he would dream and drowse at any hour which pleased him, taking no account of the sun, and in his chamber he was a soft roundness wrapped in a silver feather. I used to feel most tender toward Philibert those times he slept. He seemed so snug, so dependent and so charmingly juvenile.

They had said he would soon learn to follow me like a dog. But if such intent was his, even vaguely, he guarded it well, and ever tried to elude the hand that sought. When it held him the beatings of his heart were rapid as of old, and though he did not struggle, nor hide his head, his relief was evident when again he was free. A high, shrill chattering ensued, and in this voice I thought, but put the thought away, there was a hint of ire and boasting. Time enough there seemed to be. Time enough to tame this wilding, and win him more surely than my coins had purchased. Time enough.

"Phil! You little nutcracker! Philibert, old man! Try this!"

He would take the nut from my hand, to hoard it in his chamber against the day of drouth and famine, in which he implicitly believed, and toward which he made unremitting provision. And the wheel would whirr, for all was well with him, and he was happy in the home I had given. Oh, foolish squirrel! Oh, minor ingrate in argent gray—far happier than you know! To northward the hulking mountains where are beasts of prey and fleet raptorial fowl. To southward the strange alarms of the town, and masterless cats, and bear-dogs that would as

lief swallow a squirrel as look at him, and no sooner said than done. And to east and to west are perils not less actual. Only here is peace.

Of this I may with some degree of confidence assure myself—at the beginning there was in the cosmos of Philibert the squirrel a certain liking for the hand that ministered to him, for the voice that hailed him morning, noon and night, for the master that hoped he would follow like a dog. At my footstep on the porch, at sound of my voice within doors, the captive would race to the netting and tug at it with his paws until it twanged harp-like. And for no other would he do this. He desired my attendance at court. It was his command that I must come and hold speech with him, and when I came he would twirl the wheel right merrily, and fling himself over the tree, branch to seventh branch, in testimony to his pleasure. But the heart beneath my hand beat rapidly as ever, and the small form was fugitive. Yes, in those fleet months when first he was mine, I think the captive felt dim promptings of affection, and more than tolerated his master. I like to think so.

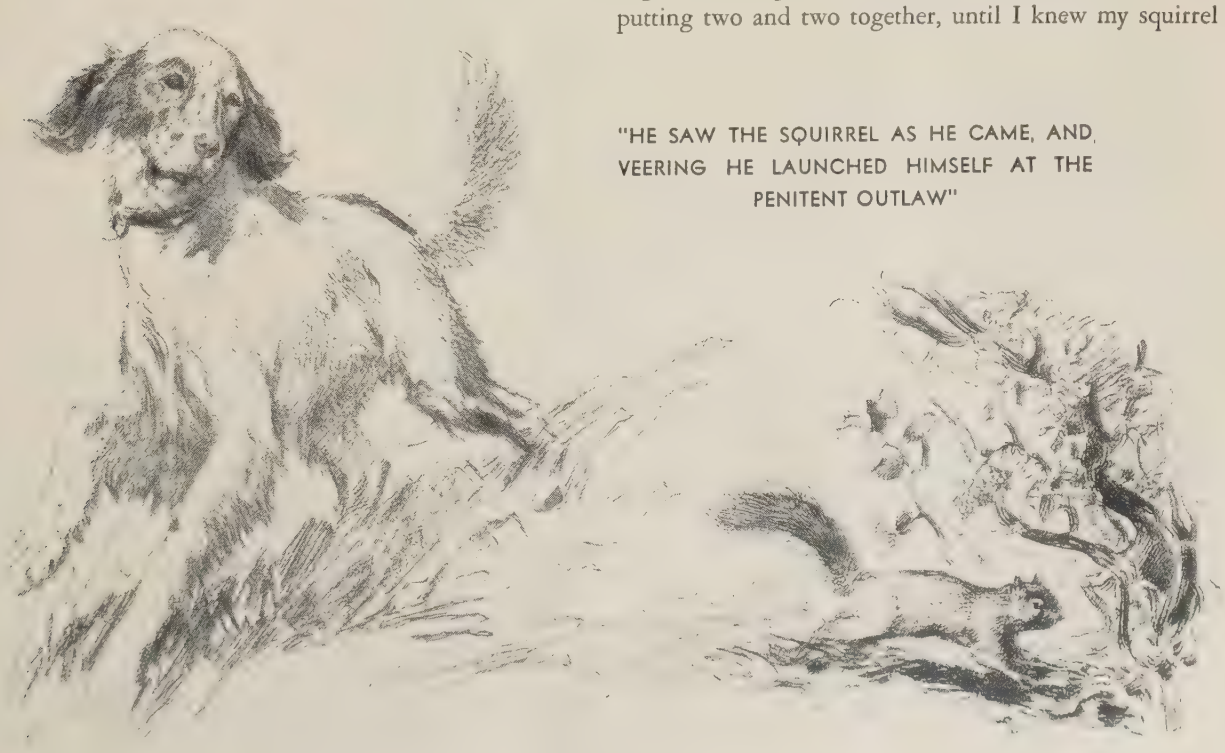
But a change came over Philibert the squirrel; the dark spell of misinterpreted familiarity. I remarked in his demeanor, though most gradually, an unaccustomed frankness and disdain; a nonchalant bearing that betokened his conviction of superiority; a trick of the eye that was near akin to contempt. He gave me gaze for gaze, as one who would say, if he but could, "How strange that ever I feared you!" That shrill, bright chattering, with a keen edge to it—had the tang of sharp, satiric mirth. No longer man and squirrel, we were to him, but squirrel and man—for I am certain that the thought of the knave ran in this wise. It was the strangest of tamings, the oddest of requitals. And his heart pattered no longer beneath my hand. He had ceased to fear, but love had not replaced the lost emotion.

Well, I grieved somewhat, though not overmuch, and clung still to my design that Philibert should one day follow me like a dog. All squirrels, so I reasoned, are whimsical fellows. They are elfin of nature, and more mercurial than any of the creatures of Providence. I would as soon believe in pixies and gnomes as in squirrels, yet here was a veritable squirrel. In this manner I reassured myself. For there seemed to be an abundance of time. And I recalled distinctly that the blacksmith's boy, who knew all the traits and wildnesses of squirrels, had said, "Mister, he likes you fine, a'ready."

It is this way with an ill-will—one has but to nurture it along enough and it will spring to action. It is fed for a single purpose, that resolve may come from enmity, and teeth be fleshed. So it is with men, and small blame to squirrels if it is some time so with them. I had opened the cage door, as I did often in a day, and had thrust in my hand, with a beckoning forefinger. I had spoken jovially, as was my wont. The little old man of the forest had chattered shrilly, and, as I verily believe, to epithetical effect. But yet I had beckoned him, for he must follow me like a dog.

"Here, Phil!" I said to him. "Come here!"

He came, that never had answered a previous summons. Came with a scurrying rush, and an evident, appalling eagerness, and through the beckoning finger, side to side, he drove the chisels of his teeth—drove and held fast. Never have I witnessed such fury in any beast, such insane fierceness of purpose, nor do I think it possible for the wolverene, who is called the Indian devil, to express such manifest malignancy. And I shook him off at length, and shut the door, while the shrillness of his wrath roused the jays in the manzanita. As I nursed the finger doubts began to whisper, and I thought of this and of that, putting two and two together, until I knew my squirrel



"HE SAW THE SQUIRREL AS HE CAME, AND, VEERING HE LAUNCHED HIMSELF AT THE PENITENT OUTLAW"

for a savage with the untamed, untamable heart of a lion.

But I could not yield so easily, for, as of old, he twanged the wires to summon me. Hoping against hope I suffered Philibert the squirrel to bite me twice and thrice before I passed sentence of banishment, opened the cage, and prudently enforced the eviction with a broom handle. He dropped lightly to the porch, and we stood round to witness his flight. The dog was there, shrewdly chidden, and the cat with emerald eyes. These two were sharply restrained, that he might be off without hindrance to the flank of the mountain and live his life in his own way. But Philibert held views on this decision. He pattered fearlessly toward the cat, that had slain a score of squirrels, and the cat arched high his back and retreated. For the setter, the red setter, he had but a fleeting glance of superiority. And up and down the porch, to and fro, marched the silver-gray, occasionally diverting himself with brisk attacks on ankles. Up and down. Spat! spat! spat!

"He'll go away presently," I said, and it was hard to utter, though the finger was but freshly bitten.

He repaired at length, and leisurely, to a leafless oak in the lawn, and at twilight the setter treed him there, with a great barking and prancing. A chill night of late autumn, a night strewn thickly with stars, such a night as withers the dahlias and bestows, at morning, a thick whiteness of frost over fence and grass. The hours were long and cold, but dawn came at last. From the kitchen, at seven, I heard a fumbling at the screen-door, a tiny twanging of the wires, and turned to see the exile. That he thought somehow to enter the warmth and cheer of the house, I have no doubt. And I may have been mistaken, but there appeared to be rime on his whiskers, and penitence in his manner.

"Philibert!" I cried.

He retreated two hops and a lope, and sat shivering wanly. Oh, foolish squirrel! Unwise and pitiful egoist! Here are hands that are warm to receive you. Let there no longer be evil between us. The cage waits. There is great store of nuts. The wheel shall spin as merrily as ever. And Philibert considered.

Then Pat the setter came round the corner, and he was waggish with the briskness of the morning, and there was laughter in his eyes and a glory of flame on his coat. He saw the squirrel as he came, and veering he launched himself at the penitent outlaw.

"Woof!" barked Pat the setter.

Flaming dog and silver squirrel raced away up the slope of the garden, until the quarry slipped into the manzanita and the pursuer crashed against that tangled sanctuary. I have never seen Philibert since. But, no matter, once we had a squirrel.

TAME CALIFORNIA QUAIL

THEY STRUT BEFORE THE CITY HALL

BY U. F. BROWN

THE California quail, now the State bird of the Sunshine commonwealth, has never been a very wild fellow. He always responds trustingly to human kindness, and a very strong proof of his friendliness was given during a recent winter in Yreka, California. Snows had made the food of the quail very scarce, and the Superintendent of Streets, Edgar Thomas, supplied food to the birds while they could not find their natural sustenance. So tame did they become that they often came out from their cover in Yreka's Auto Park on to the state highway in front of the City Hall. They were not molested, and one might have thought them to be some domestic breed, so free from fear were they, rather than members of a species that is severely hunted at certain seasons of the year. These birds are distant relatives of the friendly bob-whites that live in the East.

THE LADY TULIP OR CANDYSTICK TULIP AMONG PANSIES
This is known as Tulip clusiana and is an early blooming wild species coming to us from southern Europe

ADVENTURES WITH BULBS

BY ROMAINE B. WARE

PHOTOGRAPHS J. HORACE McFARLAND

I placed it in the earth—this bulb of mine—
And from its narrow prison-house of night
It struggled forth to reach the air and light;
* * * *
And as it rose and blossomed to the sight,
Its absolute perfection seemed divine!
—ASCHER

IT MAY be possible to garden without using any bulbs but I'm sure it can not be done as well. Imagine if you can a garden in the spring without the early Dutch crocus or even without narcissuses or tulips. It would be a sorry sort of a garden, it seems to me. And later when the lilies of midsummer add their stately elegance to the garden-close, surely it is a most unfortunate gardener who foregoes the exquisite perfection of these floral jewels. And even gladioli, common as they are today, fail to be appreciated half as much as their good qualities warrant.

Bulbous plants are different from ordinary garden subjects. There is within them something of an element of mystery. Late in the fall we bury our bulb in its prison of soil, knowing that within its heart the flower of spring is already formed, simply waiting for the urge of Nature, the gentle showers and warm sunshine of spring to bring it forth. And almost before the snow of winter disappears the bulbs send up their pointed spears, to be quickly followed by brilliant blossoms.

It seems to me that few gardeners appreciate the vast array of bulbous flowers as they should. Most every one plants a few tulips and maybe a few narcissuses. Many gardens have some tiger lilies and here and there some other kinds of bulbs, but the vast majority do not take advantage of the opportunity offered by this great group.

There are literally thousands of varieties of bulbs comprising hundreds of species available today but the ordinary garden all but ignores them and, as a result, many of the choicest of Nature's creations are overlooked. For example, how many of you are familiar with the beautiful *Calochortus*, the Mariposa or butterfly tulips of California? Mariposa is simply the Spanish name for butterfly and among this group are to be found some exquisite things. These and many other of California's native bulbs have proved adaptable to culture over a large part of the country but as yet very few gardeners have discovered them.

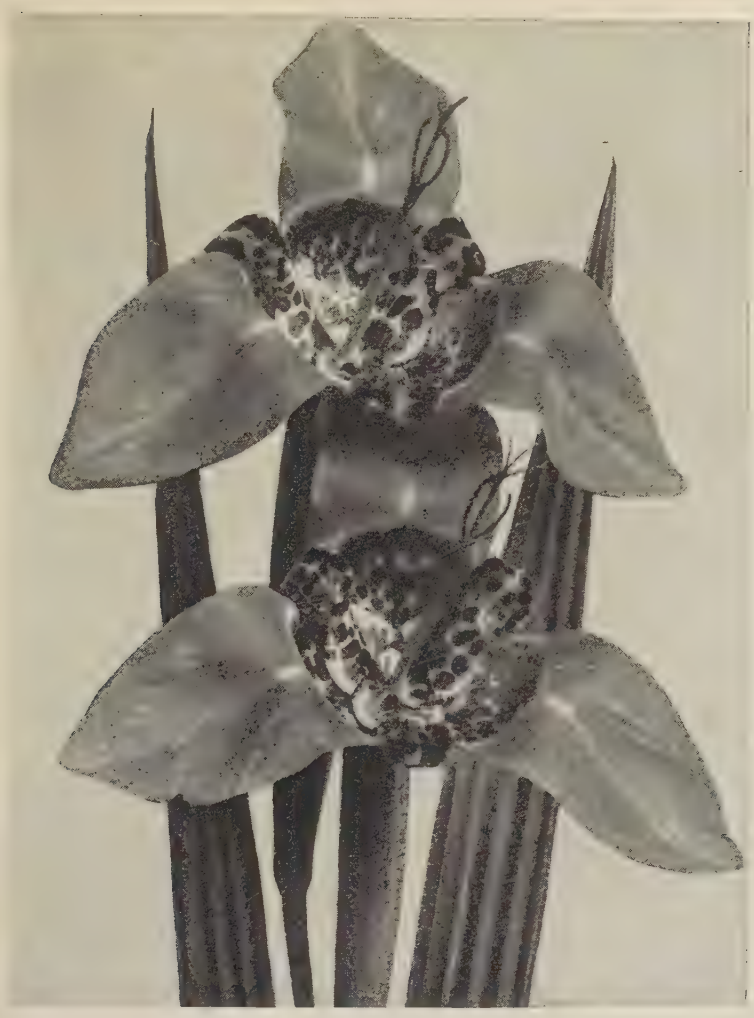
If you are going to make your garden different, a thing worthy of your personality, then you must always be on the lookout for the unusual thing. It seems to me that with bulbs you have the greatest of opportunities. Just keeping to the ordinary but little planted varieties the early spring garden may include the following—trilliums, scillas, buttercups, crocuses, chionodoxas (Glory-of-the-Snow), eranthis, fritillarias, snowdrops, mertensias, *Muscari* and others. With these and the better known tulips, narcissuses and hyacinths, countless delightful garden pictures are possible. In addition to the above bulbs there are the English, Dutch and Spanish irises that are hardy with

BRILLIANT MONTBRETIAS
These are sparkling, graceful flowers of airy grace in midsummer and autumn

COLCHICUM, AN AUTUMN-FLOWERING CROCUS-LIKE FLOWER
It is specially welcome, the blossoms appearing late in the fall after their foliage has died down

slight protection except in the sections of extreme changeability. They are a pleasing addition to the bulbs of the spring garden and now that they are being produced in larger quantities will be used more generally.

With even such well known things as tulips the opportunities for unusual garden pictures have been little appreciated. There are many thousands of named varieties in a great many different types. The early singles and doubles have lost out somewhat in their old popularity since the Darwins and Breeders have gained such favor. The



MEXICAN SHELLFLOWER
It is known as Tigridia and makes an exceedingly brilliant display

I have always longed for the time when I could test out all the different kinds of bulbs and plants that caught my fancy in reading the catalogue descriptions, but I fear that happy time will never come. We can however try out a few new things each season. By keeping a tight rein upon our desires we can hold them within bounds and still try out some of the unusual plants. Now I know some of you will say, "But where are we to find out about these new and different bulbs?" The only way is to get catalogs from many different sections of the country and study them for the delightful flowers they contain. You will soon learn where the new and noteworthy things are to be had. In many sections of this country and in Europe as well there are dealers and growers that make a speciality of new, unique and different plants. Also there are those who specialize in native plants, either collected from the wild or grown from seed. It is much better to purchase from such dealers than to try to collect the natives yourself unless you have made a serious study of the subject.

Among the tulips there are many little known botanical species that the true garden enthusiast will enjoy growing. Some may be grown in the ordinary garden borders while others are especially suited to early single tulips, however, have been hybridized with Darwins, Breeders and May-flowering Cottage tulips to produce a new race or type called Triumph tulips. In some respects they are even better than their parents, the hybridizing having frequently accentuated the better qualities from both sides. It will be some years before these new Triumph tulips can be propagated in sufficient quantities that their prices will come down where we can all buy them by the hundreds, but we can look forward to that time and even today afford a few to try them out here and there.

CROCUS TOMMASINIANUS IS ONE OF THE WILD SPECIES
Blooming much earlier than the cultivated Dutch varieties, it is easy to grow, free flowering and charming

rock garden culture. Not all of them are easy to grow but this makes them all the more interesting. If you are going to have a handsome garden, one that typifies your personality, you can well afford to make special effort to grow some of the more difficult things.

The most of us when we think of narcissuses see them as daffodils or jonquils. The three terms are much misunderstood and for simplicity the term narcissus includes them all. Lent lilies is an old English name applied to many narcissuses. There are a great many different types and forms of this large bulb family and practically all of them are of the easiest culture. Now that American bulb growers are becoming so proficient in their production we may expect to see the price come down to where we can all enjoy them by the hundreds and thousands in our gardens. I find one of the more common of the hardy garden sorts advertised by a bulb grower in the Pacific Northwest at five dollars a hundred for large, double-nose bulbs and second blooming size bulbs at three dollars a hundred.

ERYTHRONIUM OR DOG'S-TOOTH VIOLET

A west coast but adaptable species and a delightful one of the lesser known gems

Another pleasing development of the bulb industry in this country is the way the hybridizers are going after the production of new and better forms and varieties. They have imported the best of the new things from abroad at prices ranging up to five hundred dollars per bulb and we may expect the coming decades to produce some very worthwhile things. This will mean that our gardens will be able to have the finest the world produces. There are now some gorgeous new narcissuses with flowers five inches and more in diameter, produced upon stems nearly two feet tall. It is varieties of this class that presage the development of the new race of hybrids.

In planning your bulb plantings try to include a wide selection from among the many types of narcissuses. Don't just buy the commoner sorts but try out some of the less known kinds. Some of the most exquisite species are almost unknown. The little dwarf variety only growing six inches high, *Narcissus cyclamineus,* and many similar plants can be used to secure delightfully different effects. The gardener who makes the most of his opportunities has an unlimited field for accomplishment. His garden expenditures need not be excessive but thoughtful planning will achieve marvelous results.

AND THESE ARE KNOWN AS SCILLAS OR SQUILLS

Thoreau once said, "Scillas surely must have borrowed the blue of the sunniest skies for their pigment coloring"

Hyacinths have never been really popular in the average garden since the less formal style has succeeded the mathematical precision of Mid-Victorianism. They are stiff and formal, especially when planted in formal beds, but used in drifts and masses in connection with a ground cover of some of the low growing perennials, many pleasing effects are possible. Group them through drifts of pansies,

Viola, Aubrietia, Myosotis, Arabis, the golden *Alyssum,* and the pink and white rosettes of English daisies. Many pleasing color combinations may be worked out while over all the delightful fragrance of hyacinths make their presence doubly welcome. Not only can the more stiff and prim Dutch hyacinths be used this way but as a contrasting feature the less formal Roman and miniatures with their loose flower spikes and small neat bells are also attractive.

Many of us, when we think of bulbs, have in mind only the varieties mentioned above, but the true garden enthusiast will become familiar with many other bulbous flowers. There are some charming autumn flowering crocuses—colchicum or meadow saffron is their name—and they bloom from September on through the fall after their foliage has all died down. They are the last of the bulbous flowers to add the glory of blossoms to our garden pictures. But during all the months of the growing season from the time the snow vanishes in the spring until the final freeze-up of the fall there are bulbous flowers we can enjoy. The summer months are equally rich in their legacy of blossoms. Not only are there a host of lilies that we may enjoy but there are a great many lesser known but none the less interesting and beautiful species. The large family of lilies are a complete story in themselves and can be only mentioned here. Sufficient to say that among them are many of the choicest gems of the floral world and with the knowledge available today, any one who really wants to can succeed with them.

SPECIOSUM LILY LIKES A MASS OF LOW UNDERGROWTH

In the inset we have Eremurus, the desert candle, a most graceful and unusual bulbous plant. It frequently reaches a height of eight feet

Among the summer flowering bulbs, gladioli need no introduction. I would urge you however to pay special attention to the lesser known specific forms, those which have been and in the future will be the forerunner of new and improved types. There are about a hundred of these species, largely from South Africa and most of them are hardy and easy to grow. Amateur hybridizers in the past have produced some worth-while things and the field today is wide open to the thoughtful experimenter. Rewards may not be extremely large financially but choice varieties are always welcomed by the commercial growers at worthwhile prices. You should be familiar with the best varieties on the market, including the more recent introductions. Gladioli are among the most important summer flowering bulbs, especially for cut flower purposes.

There are many choice things listed as bulbs that are not truly bulbous in nature. *Eremurus,* commonly known as foxtail lily or desert candle is of this nature. Many

dealers in bulbs list it and it is also included in some lists of perennials. It is an unusual and very beautiful thing from the Himalaya mountains in India. The immense flower spikes, six to ten feet tall, are covered for the upper two or three feet with closely set bell-shaped flowers in entrancing colors. Their culture is not difficult except that the early spring growth must be protected from frosts. These bulbs or roots are scarce as yet and sell at five dollars to ten dollars each.

Among the many interesting native bulbous plants, the *Erythronium,* commonly known as dog's-tooth violet, trout lily or adder's tongue should be better known. There are quite a number of varieties; one catalogue I have lists twelve. They are not difficult to grow, needing a well-drained loamy soil with about one third by bulk of sharp sand and one third leaf mold. A partially shaded location must be selected and they will reward you with delightful clumps of their graceful flowers. The western species are much more vigorous, live longer and bloom better than do the eastern species.

Brodiaeas are another group of native bulbs that produce some interesting and lasting flowers. They are excellent in the rock garden or for naturalizing. One interesting variety, *B. brevoortia coccinea,* is known as the floral firecrackers. The bunch of vivid crimson flowers tipped with pea-green are produced at the top of a two foot stem and their resemblance to a bunch of firecrackers catches the eye at once. A dozen and a half varieties are available and they are reasonable in price. Plant them in groups and masses. A delightful effect is produced by planting them among ferns.

From Mexico comes a very showy bulbous plant, *Tigridia,* the Mexican shell flower or tiger flower. The brilliant triangular blossom is often six inches across and the color markings are brilliant. Each flower lasts but a day but successive blossoms are produced and each bulb is in bloom for several weeks. The culture is identical with gladiolus and once you grow these gorgeous blossoms you will always want them. Within the last decade, hybridizers have developed new colorings and we may expect the future to continue this improvement. These and many others of the bulbous flowers mentioned here may easily be raised from seed and with seedlings there is always the chance that you will secure a worth-while new variety. It is possible to purchase seeds of most any kind of plant or flower and along this line opens up one of the most interesting of horticulture adventures. Growing new and unusual plants from seed is a most fascinating hobby worthy of your enthusiastic attention. I have before me one catalogue listing more than four thousand different varieties of seeds and the list is not complete.

Another summer flowering bulb that has recently gained well-earned popularity is *Montbretia.* Fifteen years ago it was little known but like many other things the improvements made by hybridizers have brought it to the notice of many flower lovers. Montbretias have been greatly improved both in height and size of flower till today to make their acquaintance is to want them in your garden. Their growth is much like that of gladioli except that being small bulbs they should always be planted close together in groups of a dozen to a hundred or more. Planted five inches deep they may remain over winter where the frost does not reach that depth.

Montbretias have a sort of an airy grace to them that produce the effect of fountains of color. The bulbs, being small, may be planted around and between earlier flowering things and coming up will supply masses of delightful color for many weeks. When planted to the fore part of the hardy border the effect is specially good. As cut flowers they last particularly well and if possible an extra planting of them should be made in some out-of-the-way place just for cutting.

Hyacinthus candicans (*Galtonia*) is another of the valuable summer-flowering bulbs, perfectly hardy if frost does not reach the bulb and it will increase and give better results every year. The foliage is much like that of the spring blooming Dutch hyacinths, but larger, and the flower spikes reach a height of three to four feet. In cold sections it may be treated like gladioli and will give excellent results. Planted in the hardy border in groups or massed against a background of shrubbery it produces very effective pictures.

There are many, many other bulbous flowers that may be used to produce unusual and interesting garden effects. The less severe your climate the greater the variety, but even in the more rigorous sections there are a host of kinds that may be grown with merely ordinary precautions. One of the most important considerations is to keep your plantings balanced so that the entire growing season is well represented. Besides, your garden should present a pleasing picture as a unit. Avoid still straight lines and formal beds. Follow Nature's leading and group your garden children in the most natural way possible. As you adventure upon the highways and byways of horticulture there are many joys in store, not the least of which deal with the growing of flowers—your flowers—from bulbs.

In this article Mr. Ware, who is also editor of the Hints and Helps for Home and Garden Department, has made many helpful suggestions of varieties of bulbous plants. To those of our readers who would like also the bulletin on Planting and Care of Bulbs to supplement Mr. Ware's article may we say that a two-cent stamp will bring it to them. Just write to the Garden Editor.

WHERE CARIBBEAN WATERS GLEAM

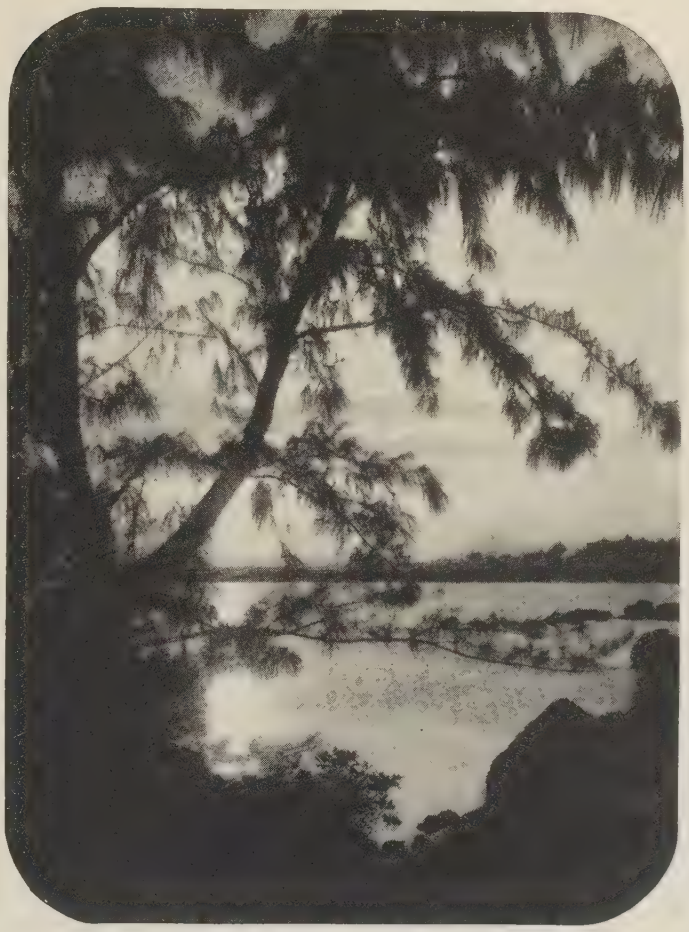
TROPIC LANDS OFFER LAST WORD IN WINTER VACATIONS

BY RICHARD WILBUR

PROBABLY one of the most abused phrases in travel literature is "the lure of the Tropics", and yet it is a difficult one for which to find a substitute. There is really something indefinably alluring and luring about coral islands, waving palms and lands where summer never takes a holiday. That this lure exists to a vast extent is testified to by the many people who take winter vacations to escape the rigor of northern winters, to revel in a flowering land and visit birds in their winter habitats.

This lure—there it is again!—has apparently reached our own readers because a number of them, in writing about the American Nature Association western trips, have asked whether a winter tropical voyage might not be arranged. It can be and has been, and the Nature interest, which is so much in evidence in the islands and on the mainland of the Caribbean, has been given special attention for such a trip.

Probably Bermuda, that cluster of coral isles in the Gulf Stream's path, is the best known and most visited of these winter playgrounds. At the time the party will visit it flowers will be at the height of their glorious profusion. Call will be made at Hamilton, and from this winter mecca one may visit the colorful sea gardens, inspect the caves with their fantastic formations of crystal, see the attractive and amazingly interesting tropical aquarium and generally revel in Bermuda's winter charm.



After Bermuda the visitors will find Port-au-Prince, Haiti, less sophisticated in many ways, certainly more primitive so far as its native population is concerned. So much in the news, Haiti is always eagerly visited and both the capital and the surrounding countryside, planted to sugar cane, cotton, coffee and tobacco, will be found fascinating. Port-au-Prince, set in an amphitheater of mountains, bears little resemblance to the capital of France, of which the natives fondly believe it to be a counterpart. But the thought and influence of France are in evidence there, found in many things, from the sidewalk cafés to the local Champ de Mars.

From Haiti to Jamaica is a transition to the largest and most important island of the British West Indies. Here seem

ON this and the two succeeding pages there are described the places to which the American Nature Association winter cruise will go. The party will leave New York on January 24 for a personally-conducted visit to the Caribbean. At all ports of call special opportunities will be made available to visit spots of special Nature interest, and there is no dearth of these. The party will arrive back in New York February 11, after a most comprehensive Caribbean cruise.

The members of the party will travel on the luxurious Cunard Liner CALEDONIA which is making this Caribbean cruise with an itinerary that fits admirably into what we regard as worth seeing in the Tropics. This does not in any way affect the separate identity of the Association's party but assures that all details will be handled in an expert way. All inquiries about the Caribbean cruise, however, should be addressed to the Director of Field Trips, American Nature Association, 1214 Sixteenth St., N. W., Washington, D C.

to be combined all the fascinating features of the tropics. One finds great cocoanut palms and giant-leafed banana trees. There are hedges of cactus that look for all the world like pipe organs; palm-lined avenues; magnificent blue-green mountains and exotic native habitations. Kingston is the capital and lies in the shadow of Blue Mountain, a peak seven thousand feet above the water. Kingston's markets are filled with many things of tropic origin.

Back to the mainland at Colon, Panama's eastern port, we become, in a sense, home again for here we make the acquaintance of the great canal, a monument to the vision and genius of some great Americans. To the visitor crossing the Isthmus by train, the Panama Canal appears like a powerful, slow-moving giant, and flowing beneath the bluest tropical skies it conveys little impression of the infinite cost in time, money and lives necessary to its accomplishment. Through the locks at Gatun, smoothly running as the simplest piece of mechanism, the largest ships afloat are raised eighty-five feet by the moving of a lever.

In Gatun Lake there is one of the most fascinating places in the world from the Nature point of view. On an island named Barro Colorado is to be found the tropical research station recently written about in Nature Magazine by Dr. Alfred of Gross and treated at a greater length in a charming recent book by Dr. Frank M. Chapman.

IN NASSAU'S RESIDENTIAL SECTION

The tropic beauty of this capital of the Bahamas will ever be remembered by the visitor

TRANSPORT AND TRAVEL IN HAITI

A street scene in Port-au-Prince. Two citizens of color discuss the news of the day

Turning seaward once more we reach Havana, as quaintly Spanish as Old Castile, as sparkling and sophisticated as Monte Carlo—a light-hearted, pleasure-loving city that is utterly enchanting and full of many charms. Although it is not far away from our own shores, it is as foreign as anything the Old World holds. Mighty fortresses and charming castles, which still breathe the romance and history of days gone by, lend a spectacular touch to the natural beauty of the place. Old Morro Castle rises dramatically from her rocky base to guard the harbor where the *Maine* was sunk, not so many years ago. Cabañas stretches her proud form along the brow of a hill nearby. The magnificent buildings of the Malecon, with their Spanish façades, curve along the Sea Wall Drive. The bronze figure of La Habana watches over the city from the Fort where De Soto set forth for the conquest of Florida. Narrow, cobbled streets with awning roofs and balconied houses—for all the world like a bit of old Spain—run down to the water's edge and bid us explore this wonderful place.

In the heart of the city is the Plaza de Armas, surrounded by old Spanish government buildings, which dates back to the early part of the sixteenth century. It is the original Military Square around which Havana was built up—for it was the custom, back in the days of the Spanish conquerors, to lay

MORRO CASTLE, RICH IN HISTORY

This is only one of the many places in Havana and vicinity that the visitor will wish to see

out a town around such a square. Another relic of the first days of Havana is an ancient fort—La Fuerza, which is the oldest European structure in the Western Hemisphere. Among the interesting places to visit are the President's Palace, an attractive stucco building with Spanish colonnades; a cathedral dating back to 1656, in which the bones of Columbus once reposed; the Prado and Vedado; a cigar factory; Punta Castle, and many other dungeoned fortresses and venerable churches. After seeing the points of interest, the visitor can explore the shops and perhaps pick up a bargain in Spanish shawls, embroidered linens, or Panama hats; he can enjoy some golf or a swim, watch the jai alai games, attend the races, or dance in the Casino—or just stop at a lively sidewalk café and watch the world go by.

Nassau, last of all, is full of sunlight and seventeenth century atmosphere. The sunlight reflected on the gleaming white sand of the harbor turns the ordinary hues of tropical water into a rarity of color unparalleled. The pageant of color is continued in miniature at the sea-bottom, and the gleaming fish and fantastic sub-aqueous plants to be seen through the glass-bottomed boats at the Sea Gardens are like living jewels and silks. Ashore, gateways are half hidden by masses of flaming bougainvillea, and the ancient walls of the houses are characteristically pink and blue and buff. Half of Nassau's charm is in the odd life to be seen in the markets in "Sponge Yard" and in the picturesque native quarters. The other is in the brilliant social life of the winter season, when yachts crowd the harbor and the gorgeous hotels are thronged with the leisurely pleasure-seekers of two continents.

Words, as a matter of fact, cannot adequately describe a good many of the scenes one sees and the impressions one carries away from places of exceptional beauty or of exotic charm. In its trips to the trails of the western mountains, the American Nature Association has sought principally to reach those places and interpret for the members of its parties those things not usually seen by the casual tourist. This, after all, is what makes a trip worth while and something of permanent value as a memory. On the Caribbean trip this same thought is fundamental in the program as mapped out. But after all, whether it be the majestic glory of the Rockies, the grandeur of the Grand Canyon, the softer beauty of the White Mountains, the charm of the Great Smokies or "the lure of the tropics" one has to see with one's own eyes.

A TYPICAL HOME IN BERMUDA

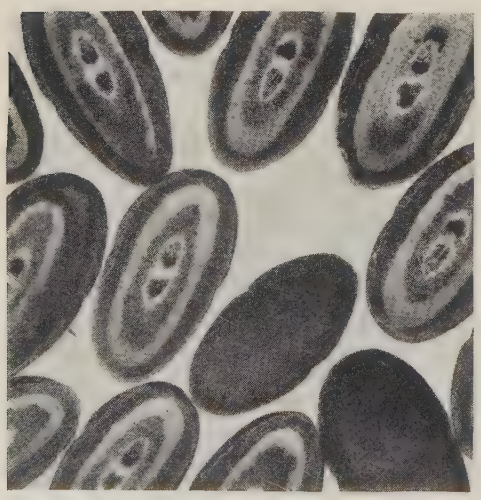
The white roofs against the blue of sky and sea fit into a picture of brilliance and beauty

CASTLETON GARDENS IN JAMAICA

Here the members of the Association's party will see tropic vegetation in all its glory

POISONOUS SEEDS
Cockle plant embryos are responsible for githagism, a dangerous disease

LIKE SEA SHELLS
The handsome seeds of the night-flowering catchfly are among the seed beauties



BRACTED PLANTAIN
Its boat-shaped seeds resemble those of buckhorn, a related species of weed

BY THEIR SEEDS YOU

BY ALBERT A. HANSEN

ILLUSTRATED WITH HIGHLY MAGNIFIED VIEWS BY THE AUTHOR

DURING the height of the seed buying season, which occurs in the winter months and not during the summer as many of us suppose, I visited a huge seed plant in Chicago that is said to be the largest seed establishment in the world. After viewing acres of floor space piled high with thousands of sacks of seed, I noted a half dozen men in one corner of a large room who seemed to be busily occupied peering endlessly at seeds through microscopes.

These men, I was told, are called seed analysts and they spend their lives carefully examining and analysing every lot of seed brought into the establishment. Here, indeed, is a profession few of us have ever heard about, but a profession, nevertheless, that employs hundreds of men and women. Their main stock in trade is the ability to recognize at sight the various weed seeds that infest commercial seed. And as I watched them work I was impressed by the fact that even though mankind is dependent upon seeds for existence, rare is the man or woman who can recognize and correctly name even so small a number as a half dozen seeds. Strange that we should know so much about the different kinds of plants but so little about the seeds upon which the very existence of plants depends.

There are approximately twenty thousand different species of plants in the United States and no two species produce exactly similar seeds. True, closely related species, such as bracted plantain and common buckhorn, show their relationship in their boat-shaped seeds, but even a casual glance will reveal many points of difference. A skilled analyst can readily identify plants by their embryos.

A seed is merely a miniature plant curled within a coat and usually supplied with a quantity of food to give it a start in the world. Separate the two halves of a bean, which form together the reserve food, and examine the tiny connecting structure. It is a plant in miniature with a twisted bud of almost microscopic leaves and a stem and a root.

In a number of rural schools the study of weed seeds is included in the curriculum, each student being required to make a collection of from fifty to a hundred which are usually stored in small vials or bottles. Many of the students find this a fascinating subject and continue it voluntarily long after school requirements are met. From their ranks come many of our seed analysts in government, state and private laboratories.

If one gathers seeds from wood and field, and studies them under a microscope, a new world is revealed. Delicate tracings and strange markings, undreamed of before, will be discovered. Some seeds, particularly members of the cockle family such as the common night-flowering catchfly, corn cockle and bladder campion, resemble the

SHALL KNOW THEM

EACH PLANT HAS ITS EMBRYO FORM WHICH THE EXPERT CAN RECOGNIZE

beautiful shells found on seashores, while the wild carrot and castor bean so closely resemble beetles that it is difficult to tell the difference without close examination. This fact is particularly true of the castor bean, which is an ornamental species frequently called mole bean in the rural districts because of the common belief among farmers that planting this bean will drive moles out of the lawn. The seed is about the size and shape of a small june bug and is equipped with wing markings and a head with a pair of beetle-like eyes. Possibly such imitation is practised by Nature to deceive birds into eating the seeds in mistake for bugs. The hard coat insures safe passage through the digestive tract, and the result is wide dispersal and planting under conditions exceptionally favorable for growth.

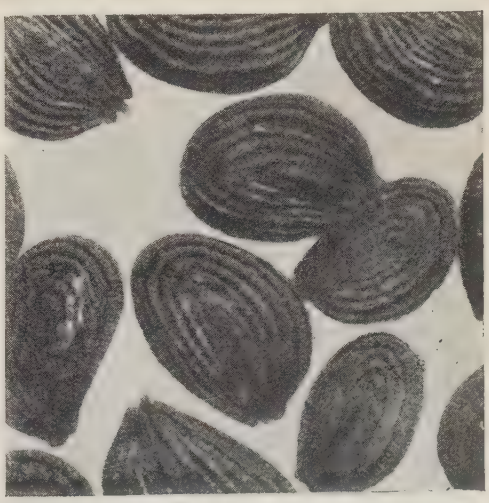
Many seeds, such as dock, catalpa, maple and ash, grow wings of their own. Others like the common dandelion of our front lawns, develop tiny parachutes to aid their flight from the parent plant. The greatest sower of seeds is not man, as we are wont to believe, but the wind.

Many curious devices are developed by seeds and fruits to secure distribution. There are hooked appendages developed to catch on passing objects, among which beggar lice and Spanish needles are perhaps best known; some plants have canoe-shaped structures to insure floating on the surface of streams, or explosive devices that shoot the seeds long distances from the parent plant. The method developed by tumble-weeds are ingenious in the extreme. These plants break off at the ground line on maturity and go bounding over the ground propelled by the wind, depositing seeds at every bounce like pepper from a shaker. During the early nineties one of these tumbleweeds, the Russian thistle, caused so much alarm in the unfenced plains country of the west that Congress passed a bill appropriating two millions of dollars to combat the plague. Fencing the land finally put a stop to the nuisance since the careers of the bounding plants were cut short when trapped on fence wire.

The fact that seeds have personalities and structures all their own has been utilized in the art of cleaning noxious weed seeds from crop seeds. The seeds of dodder, a parasitic weed on clover and alfalfa capable of completely ruining these two crops, can neither be screened nor blown out of the crop seeds. It was found, however, that dodder seed coats are rough, whereas the coats of clover and alfalfa are smooth and shiny. Nowadays the up-to-date seedsman adds fine iron filings to any lot of seed shown by the seed analyst to be infested with dodder. The filings adhere to the rough dodder coats but not to the slippery clover or alfalfa coverings and when the mixture is passed under a huge magnet the iron-coated dodder

BUGS OR SEEDS?
Though they resemble insects, they are only the queer seeds of wild carrot

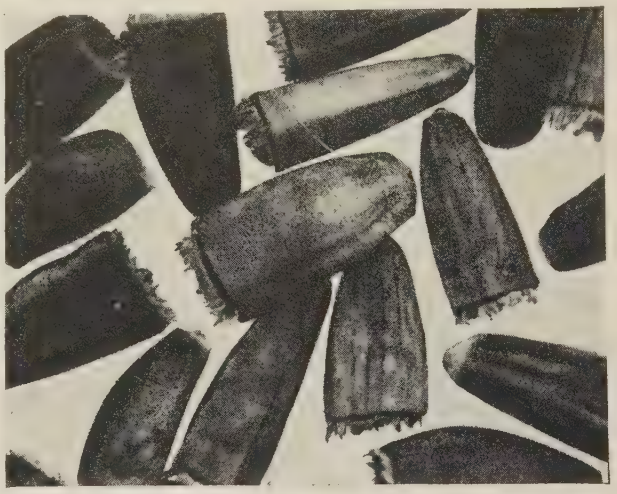
MUCH LIKE WHEAT
Many farmers erroneously believe that these cheat seeds are wheat degenerates



A WESTERN PEST
Called stinkweed because it imparts an unpleasant odor and flavor to flour

seeds are attracted by the device and readily separated.

A study of buckhorn, commonest of lawn and pasture pests, revealed to analysts long ago that when the seeds were moistened a mucilaginous jacket forms on them. Upon this fact has been built an ingenious machine in which crop seeds infested with buckhorn are moistened, then mixed with sawdust, which adheres to the sticky buckhorn, and dried. So much larger does the sawdust make the buckhorn particles that these can be readily screened out. Incidentally, buckhorn seeds, on account of the somewhat gelatinous coat that develops when moistened, have recently been marketed for the same mechanical-medicinal functions as mineral oil. So there is some good even in a vicious pest.



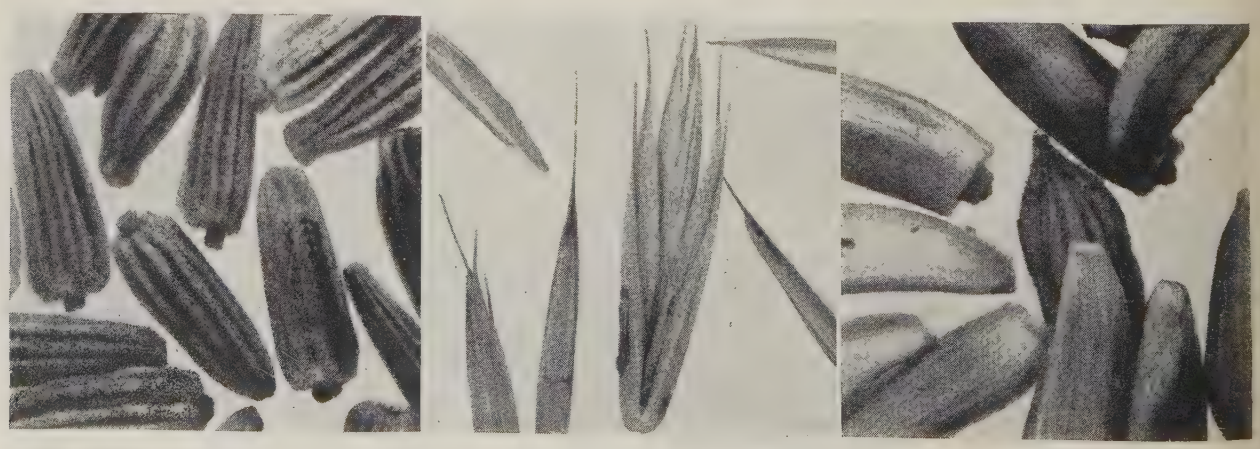
HANDSOME FUTURE PLANTS
Chicory seeds are attractively mottled, and can easily be distinguished from other kinds

In many sections of the country, as for example the great grain districts of the West, weeds are becoming the limiting factor in the production of profitable crops, as sow thistle actually causes complete changes in methods of farming. On account of their tremendous importance, seedsmen invest thousands of dollars in machinery for the cleaning of crop seed. During the cleaning season a modern seed establishment is an interesting sight, resembling a great industrial plant with its batteries of variously designed machines for the removal of weed seeds. One type of machine designed by a Chicago firm utilizes sugar solutions for separating seeds according to their specific gravities. The device is over a hundred feet high, costs about $250,000 and rivals in ingenuity some of the most intricate machines of industry.

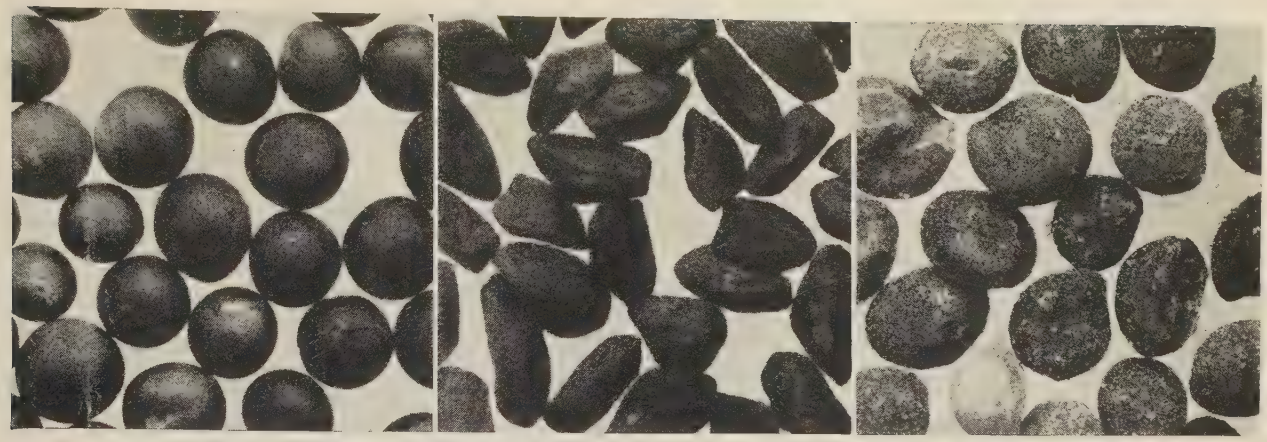
Although it is true that some seeds simulate insects, the reverse is also true. Some time ago S. R. Miles, County Agricultural Agent at Columbus, Indiana, forwarded to the Purdue University Agricultural Experiment Station for identification a number of objects that closely resembled clover seeds except for the fact that they jumped around in crazy fashion. They turned out to be insect galls that had probably formed on an oak tree and the jumping motion was due to insect pupae within, much as in the case of the famous Mexican jumping beans frequently offered for sale in novelty shops.

Although seeds are the principal means by which plants reproduce, many species can be propagated by rooting at the joints, from cuttings and by other vegetative means. When vegetative reproduction is continued for several generations the species gradually loses its ability to produce live seeds. This is well illustrated in the case of the common white potato, which is propagated by tuber cuttings containing buds or "eyes" and not by means of seeds. As a result true seeds rarely form; in fact, many potato growers have raised the crop for a number of years without ever seeing the "seed balls" or fruits in which true seeds develop. The sugar plant is grown from canes laid end to end, the roots forming at the joints. In the banana the seeds have degenerated into the familiar tiny black or brown specks imbedded in the flesh of the fruit which have long ago lost their ability to sprout.

Some of our common weed seeds are poisonous. A toxic principle in cockle seeds is responsible for a human disease, formerly common in parts of Europe, called githagism, due to eating bread made from flour containing the ground seeds of cockle. Fortunately, modern milling methods of separating weed seeds from wheat have removed practically all danger and today githagism



THREE PESTS FARMERS WOULD LIKE TO ERADICATE
Though beautiful, the black and white grooved seeds of the daisy are as unwelcome as the tapering embryos of quack grass, a dangerous weed, and as the blunt seeds of the worst pest of all, the Canada thistle



NO FAVORITES EXIST AMONG THESE COMMON WEEDS

The spherical seeds of the mustard plant supply the world with mustard plasters, but few redeeming virtues have the black irregular seeds of broad-leaf plantain or the semi-round seeds of the parasitic dodder

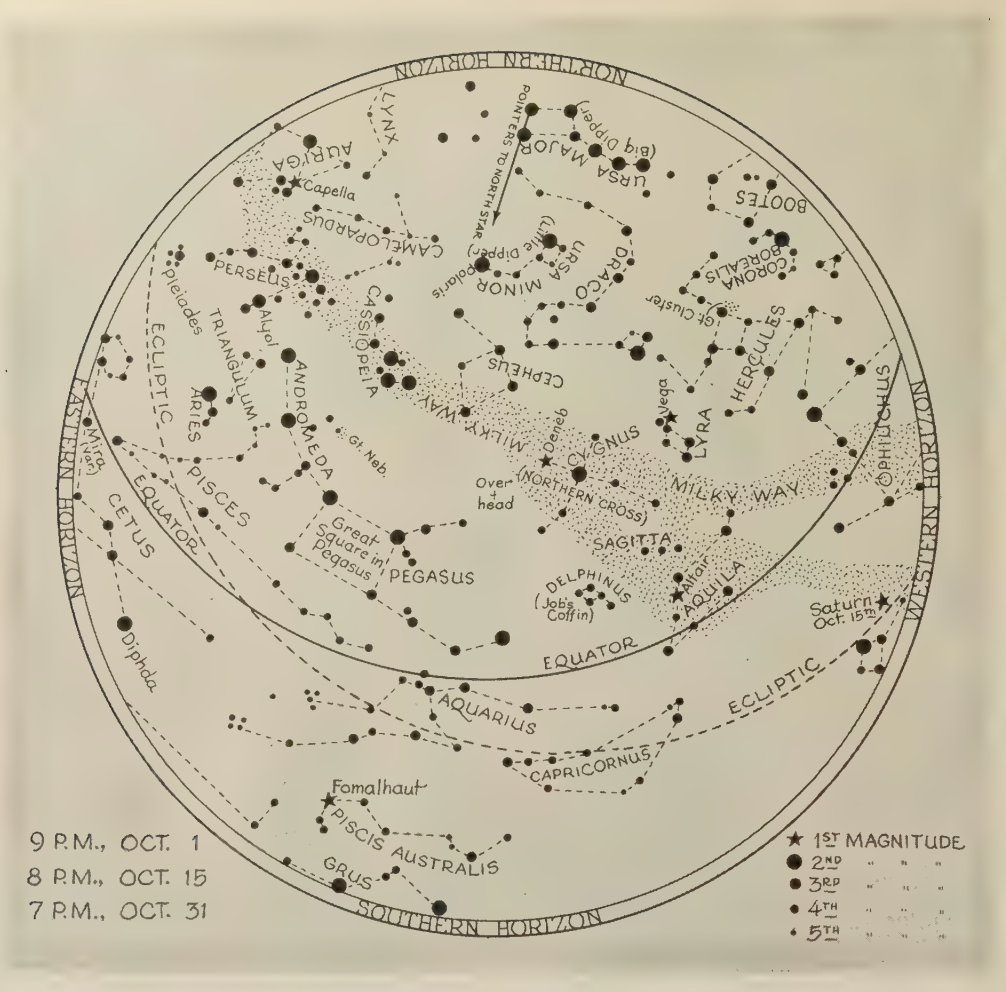
is a rare disease. The seeds of members of the mustard family are also digestive irritants and where wild mustard seeds screened from seed wheat are ground and utilized in stock feeds, fatal poisoning of livestock, particularly hogs, may result. In some sections of Canada considerable trouble of this character has been experienced. Another weed of grainfields that produces poisonous seeds is a grass known as darnel. When ground with wheat into flour, darnel causes a type of poisoning characterized by headache and drowsiness and, in extreme cases, fatal convulsions. The toxic properties have even been known to affect beer made from darnel-infested grain. The poisonous principle is believed to be associated with a fungus that infects darnel seeds. It is similar in this respect to a poisonous fungus known as scab that affects barley, causing the grain to be so unpalatable as to be untouched by livestock. When animals do eat scabby barley they become seriously ill.

SEEDS OF WILD OATS

Not the variety young men sow but the type that causes farmers to tear their hair

A remarkable feature of many seeds is their ability to retain life for extremely long periods. Thus the seeds of the common weed known as velvet leaf have been known to retain life in the soil for over half a century and there is experimental evidence indicating that some members of the bean family produce seeds capable of retaining life for over two hundred years. No credence, however, should be placed in the oft-heard story regarding the germination of grains of wheat from Egyptian mummies thousands of years old. A number of these cases have been investigated but no proof has yet been found that seeds may retain life for so long a time. In one baffling instance oat seeds found in a mummy actually sprouted but further investigation revealed that the mummy had been stored in a stable where the oats had fallen through a crack in the casing. So the safest thing to do when you read these stories of the life of a seed grain is to take them with a grain of salt.

The several parties which hit the trails of the West this summer under the auspices of the American Nature Association have reaffirmed our belief in the sound value of this activity. Despite the general conditions seriously affecting travel more people went with Association parties this year than last, and the remarkable response to the announcement of the trips indicated that even more would have gone under ordinary conditions. A report on the western trips will be made in the November issue.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south

MEET THE PLANETS

HOW TO TELL THEM AND WHERE TO LOOK FOR THEM

BY ISABEL M. LEWIS

OF THE seven planets of the solar system, in addition to the planet Earth upon which we live, there are two, Uranus and Neptune, that do not appeal to us as greatly as the remaining five because they are so distant and so faint. To observe either of these two planets one must know exactly where to look and then he will not be greatly rewarded for his pains. Uranus appears to the naked eye as a very faint star almost at the limit of visibility. Neptune, an eighth magnitude star in appearance, can readily be seen with a good field glass but exhibits no interesting features. The five remaining planets, however, have been known to man from the remotest ages and have distinctive characteristics that aid observers greatly in distinguishing them.

Mercury and Venus, the two planets whose orbits lie inside of the earth's orbit, differ greatly from the outer planets, Mars, Jupiter and Saturn. Neither of these planets can be "in opposition" to the sun or on the meridian at midnight. They are in inferior conjunction with the sun when in line with the earth and sun and between the earth and sun. They are in superior conjunction with the sun when again in line with earth and sun with the sun between them and the earth. At such times they are, of course, always invisible. In fact, for some days before and after these dates, they are still too close to the sun to be seen. They are seen at their best when farthest east or west of the sun at the time of their greatest "elongations." Mercury, the nearer to the sun and for that

reason the most difficult of all the planets to observe, never gets more than about 28 degrees east or west of the sun. This represents its *greatest possible* elongation. It is only visible for about a week before and after the dates of its elongations, in the morning twilight at western elongations, and in the evening twilight at eastern elongations. It may then be seen for an hour or so in the twilight at no great distance above the horizon. It resembles a first magnitude star, varying in brightness with circumstances but generally about as bright as the brilliant Vega and rather whitish in color. It is best seen in the evening at the elongations that come in March or April and in the morning in the elongations in September and October. One generally has to hunt for it in the twilight knowing its position in advance with respect to a bright planet or star or the points of the compass.

If Mercury is the most difficult planet to find, Venus is the easiest. It is far superior to any other planet or stellar object in brightness. The answer to that often-asked question "What is that beautiful star now visible in the west in the evening?" is usually "Venus." For when Venus is at her best in the evening sky she attracts universal admiration. To be sure she is quite as beautiful when Morning Star for equally long periods but most of us are not up in time to see this glorious planet before sunrise. At most favorable elongations Venus will be as much as 47 or 48 degrees from the sun and may set more than three hours after the sun or rise more than three hours before it according to whether it is east or west of the sun. In color Venus is a beautiful silvery white and, like Mercury, exhibits all the different phases of the moon when viewed through the telescope. Between inferior conjunction with the sun and elongations, it shows the crescent phase; at the elongations it looks like the moon at first and last quarter; and between elongations and superior conjunction with the sun, it is more or less gibbous in shape. Even when farthest from the earth and seen under most unfavorable conditions, Venus is much more brilliant than the brightest of all the stars, Sirius. One will soon learn to recognize Venus whenever visible by its beautiful silvery color and exceptional splendor. Neither Mercury nor Venus has moons. If one is fortunate enough to have a small telescope it will be possible to see the phases of Mercury and Venus, a conclusive proof that it is a planet lying within the earth's orbit. As we have said, the remarkable brilliancy of Venus will serve to distinguish it from all other stellar objects.

Jupiter, the nearest rival of Venus in brightness, is in general somewhat brighter than Sirius and a steady golden yellow in color. It can most readily be recognized by the fact that it shines without any scintillation or flickering of light. This is one way in which a planet may be distinguished from a star and it is most noticeable in the case of Jupiter. Although Jupiter is the closest rival of Venus in splendor there should never be any difficulty in distinguishing the two because they are so different in color as well as in brightness. If the planet is observed in the midnight hours it is, of course, Jupiter because Venus never gets far away from the sun. If one has a good field glass the question of the identity of Jupiter will be settled by the fact that it is attended by four satellites, which are visible even with the aid of as little optical power as a good opera glass. A small telescope will also show the interesting belts of Jupiter.

Mars and Saturn are easily distinguished from the other planets. Saturn is a pale yellow in color; Mars a decided red. The latter planet will never be mistaken for any other planet but at times it is very similar in appearance to Antares, called for this reason the "Rival of Mars." It might also be mistaken for Aldebaran, or Alpha Tauri, which is the bright red star in the eye of the Bull. If one is familiar with these two stars there will be no trouble on this score though at times Mars passes through both the constellations of Scorpio, in which Antares lies, and Taurus, of which Aldebaran is the brightest star. Mars also can be recognized by the fact that it shines with the steady, unflickering light of a planet and will show the characteristic planetary disk in a small telescope. Its motion with respect to the stars which will be noticeable if one observes it on a number of successive evenings will also prove it to be a planet.

Saturn should be observed if possible with a small telescope. This will show its remarkable system of three rings and one or two of the brighter of its numerous satellites. Saturn moves very slowly among the stars because of its great distance compared to the other bright planets and it will remain in the same constellation for many months. At present it is in the constellation of Sagittarius. Its steady, pale yellowish light and its greater brilliance will distinguish it from the stars in Sagittarius. Even with the aid of an opera glass it should be possible to note that it has a perceptible disk, though the rings will not be visible to advantage without a telescope of at least two and one-half inches in diameter.

A most favorable time to observe the planets, relative to one another, is when they are in conjunction, that is when one passes close to another and directly north or south of it. Then the relative colors and brightness of the two planets are most easily compared. On comparatively rare occasions three or more planets will be found within a few degrees of one another.

When one has once become acquainted with the five brightest planets it will be an easy matter to recognize them on future occasions when one will have quite the feeling of greeting an old friend.

It may be well to remember that the planets will only be found within the narrow belt of the zodiac which extends about eight degrees to either side of the ecliptic and encircles the entire heavens. To this region of the heavens, therefore, we should always confine our search for planets. They will never be found elsewhere.

An interesting celestial event this month will be the occultation of the bright star Antares, or Alpha Scorpii, by the moon.

Occultation means "a hiding" and an occultation of a star by the moon is a temporary (Continued on page 256)

THINGS TO THINK ABOUT

A PAGE DEVOTED TO CONSERVATION FROM VARYING ANGLES

Food for Game Birds

Everywhere we find the lack of food and cover stressed as a primary reason for the decline in our native game birds. Some of these statements seem calculated to convince the uninitiated that if we could restore these lacking needs, hordes of game birds would spring up like mushrooms.

Now no one can fail to appreciate that upland game birds must have food and cover, and that water birds need food and moisture. Bobwhites cannot exist in optimum numbers on intensively cultivated land, nor can ducks exist in a waterless desert. What we wish to emphasize is that there are still vast areas, abounding in food and cover, from which the game has been killed. Is the sagebrush getting so scarce that it cannot support a few thousand sage-grouse? Are there not enough coniferous trees to keep the Canada grouse from starvation? Who believes that drainage has had aught to do with the diminution of the woodcock? Within the past twenty years the ruffed grouse, formerly common, has virtually disappeared from the country surrounding the District of Columbia. But there still remain thousands of acres of mixed woodland abounding in the succulent herbage and berries and nuts that the grouse delight in, enough to keep indefinitely from want many thousands of grouse. Millions of acres in our land need only the exile of the gun to harbor again the birds that formerly graced their coverts. Banishment of the gun will not soon come, but while it continues each year to bring nearer to extinction the birds it has marked for its own, let us spend less time repeating that game birds cannot live without food and cover. Feed the birds by all means, but do not expect food, or cover, or water to bring dead birds back to life.

Protection for the Bear

The bear (we speak in a generic sense) is finding his friends. For several years some of the sportsmen's organizations have been trying to have the black bear more generally recognized as a game animal, that he may at least receive protection during some part of the year. An impression gets around that the brown bear in Alaska is on the road to extermination, and protests are broadcast. The American Society of Mammalogists passes a resolution recommending that sanctuaries be established in Alaska for his benefit. The radio is invoked in his behalf.

We are glad to see these concrete evidences that the bear has some friends, for he needs them. California, after exterminating her grizzly bear, adopted formally a flag bearing his figure, a relic of pioneer days. Today only a few of our western states can boast a live grizzly, a species considered by many as America's noblest and most distinctive animal. The black bear, with few black marks against his name, still survives by virtue of his cleverness in many of our states, but he needs all his friends. To kill a bear, even a baby one if no better presents itself, is the ambition of every amateur hunter. In a number of states the bear receives nominal protection for a part of the year, but in others he is unprotected or even has a price on his head, seemingly just because he is a bear. People of a certain cult kill bears—black, grizzly or polar—with bow and arrow, a weapon whose ineffectiveness compared to the rifle leads many to regard it as harmless or even humane, but which is in truth most barbarous when used against a large animal.

A few individual bears develop destructive habits, and must be killed. Some of the larger kinds have been known to maim or even kill a human being, but such instances are rare. In almost all cases, the bear is blameless in his habits. He is among the most interesting of our wild creatures, and we are glad that his friends are pleading his case. And it is especially gratifying to note that among his champions are some who formerly killed him, but who have displaced the rifle and trap with the camera.

Estimating Wild Life

We have been criticised because we intimated that some states issue an unlimited number of licenses to kill game without regard to the amount that may be present in its covers. It seems, nevertheless, that some knowledge of how much game there is to kill should be the first requisite of game administration. Failure to ascertain how many fur seals were present, and still allowing 100,000 to be killed each year, nearly wiped out the greatest herd in existence. No farmer would be foolish enough to kill a hundred fowls from his flock each market day, unless he knew how many he had. Failure to regulate the kill in accordance with the supply has brought most of our game species to their present plight. As it is only a few of the states know how much game is killed each year, let alone how much is left.

It should be evident that each state should require of its licensed hunters and trappers that the kill be reported. It does not seem unreasonable that the filing of such a declaration should determine the applicant's fitness to obtain a license the next year. There may be administrative difficulties, but we are told that wild life management is a large business, and all great concerns have to establish efficient methods of accounting. As a matter of fact licenses are limited in the case of certain species, and in certain states. Sometimes such laws or regulations are not generally obeyed, and are not enforced. Your average sportsman does not wish to comply with regulations or "red-tape", although we are assured that he has the welfare of the game at heart. However, he who runs may read, and if he will look about him he will everywhere see the consequences of reaping more than the increase of the crop. And as surely as the rules of mathematics hold true, just so surely will he learn, eventually, that the hope of getting the share of some one else, when his share is gone, is a vain one.

If the states really sense the situation they will take count of their stocks of game. Those that fail to do this surely expose themselves to the serious charge of being indifferent to the trust they hold.

A Bounty on Goshawks

From November, 1929, to May 1, 1930, a bounty of $5.00 was offered for each Goshawk killed in Pennsylvania. The interest in the subject caused the "Cardinal", official organ of the Audubon Society of Sewickley, Pa., to print a report on the operation of the law in its July number. Two papers are presented: "A Defence of the Law" by L. A. Luttringer, Jr., of the Game Commission, and a brief against it by Bayard H. Christy, well-known conservationist. Here are some of the facts.

Only 76 actual Goshawks were presented for bounty. Besides these, however, there were presented, and apparently paid for, 165 red-tailed hawks; 120 Cooper's hawks; 84 red-shouldered hawks; 28 marsh hawks; 9 sharp-shinned hawks; 7 rough-legged hawks; 4 sparrow hawks; 3 broad-winged hawks; 3 duck hawks; 1 pigeon hawk; 1 osprey; 1 short-eared owl; and 1 great-horned owl. "The numbers of hawks sent in to Harrisburg do not include all the birds killed. Ofttimes game protectors and justices of the peace were handed specimens which obviously were not Goshawks; and these, of course, were disposed of otherwise."

The stomachs of all the hawks in proper condition were examined; the reports of these corroborate in the main the generally accepted conclusion that the Goshawk, Cooper's, and sharp-shinned hawks are the most destructive, while the others named are either beneficial or so rare that their depredations are practically negligible. Nevertheless the destruction of nearly 300 beautiful birds, most of which were admittedly beneficial to man, was justified by the Game Commission because a much lesser number of injurious ones were taken. A few of the birds presented for bounty are protected by law, but we are not told what action was taken in these cases. And less than one in six of the Goshawks taken had eaten ruffed grouse, the bird for whose benefit all the destruction was waged! Beneficial hawks were killed in practically everyone of the State's sixty-seven counties, but Goshawks came from only half of these. It is regretted that Mr. Christy's denunciation of this law, and his plea for its repeal cannot here be discussed in full. He points out in convincing language the fallacies back of it, the inconsistencies apparent in the statement defending it, and the obvious remedy. Let us hope that the law will be repealed.

The passing of such laws, and the results that are evident from even a short period of operation, lead us to wonder what method of reasoning is back of the almost universal prejudice against hawks and owls on the part of those who carry guns. For more than thirty years the beneficial habits of most of the species have been emphasized, the conclusions being based on studies by men of recognized authority. Yet it will be recalled that a canvass of sportsmen's organizations and game commissions, instituted a year or so ago by the National Association of Audubon Societies, revealed an attitude of hostility so general that it seems almost useless to appeal to the fair-mindedness of those responsible. And bounty laws against hawks are still operative in several states.

Helps and Hints
FOR HOME AND GARDEN

PLANTING THE GARDEN, MONTH BY MONTH

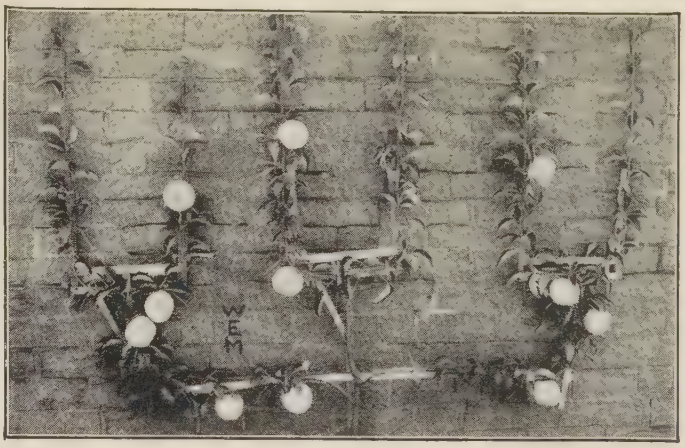
By Romaine B. Ware

"And I beseech you, forget not to inform yourself diligently as may be, in things that belong to gardening."
—JOHN EVELYN (1620-1706)

THIS is "clean-up" time in the garden. Much may be accomplished at this season and you will be just that much ahead next spring. Your garden should be a model of neatness, cleanliness and sweetness at this time, only rivaled by the freshly spaded garden in the spring. The dead tops of perennials and annuals should be removed and are best disposed of by burning. If placed in the compost heap many disease spores and eggs of insects will carry over to next season. I know one commercial gardener who not only cuts off and burns all tops but carefully picks up every leaf, that there will be no chance of any disease being perpetuated. Cleanliness in the garden brings its own reward and you will learn this sooner or later among your own flowers. Some gardeners seem to think that nature's method in making the old tops act as a sort of a mulch and winter protection, can be used in the garden. This, however, is not a wise plan because our gardening methods are frequently quite artificial and inclined to the attack of insect pests and diseases. Thoroughly cleaned up, the garden then has a much better chance to start the next year right.

Except in the most northern sections there is still time to do a great deal of planting. When frost halts active growth and plants shed their leaves, they are generally in prime condition for transplanting. One of the greatest handicaps to moving a plant in full leaf is the excessive evaporation through the foliage but at this season when the leaves have fallen there is not this difficulty. Of course moisture is lost from the bark of branches but not to as great an extent. If the top growth is cut back at the time of transplanting as it should be there will be comparatively little danger from this source. This applies to trees and shrubs except evergreens which should not be moved at this season.

From the time their leaves fall until the real freeze-up is a good time to set out those bushes. This applies except in sections where the winters are very severe, then spring planting is advisable. Fall planted roses have the great advantage of making root growth till the ground freezes up and of course they start root growth again in the early spring, weeks before it would be possible to start spring planting. It is this root growth that produces good top growth and quality bloom later in the season. But there is one important precaution that must be taken with all fall planted Roses, they must be protected over the winter or they will not come through alive. Just before the final



Marshall's Trained Fruit Trees

Consistent with the progressive policy of our firm we have, for some years past, been working up a stock of trained fruit trees, so that the keen and discriminating gardener can enjoy the many advantages of having such trees on his premises.

Trained Fruit Trees serve a dual purpose. They are both ornamental and useful. In spring their exquisite blossoms add a decorative touch to the early garden display but our appreciation is greatest when they offer us their luscious fruits in the fall.

We issue an illustrated list on Trained Fruit Trees, which tells you how to prune and cultivate them. It also gives full particulars of the various shapes, sizes and prices in which these trees may be obtained.

A copy of this list will be mailed to you upon application. Learn how to have beauty as well as luscious fruits in your garden.

THE CORAL LILY

The Coral Lily

L. TENUIFOLIUM

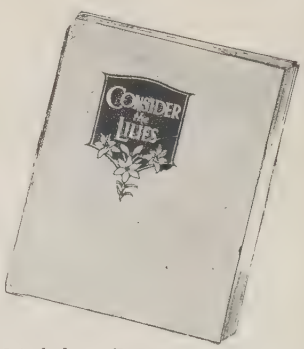
A most attractive Lily for Rock Gardens or in the foreground of the Herbaceous Border, attaining a height of 18 inches to 2 feet. Bears large heads of pendulous, waxen, deep scarlet flowers on wiry stems, covered with narrow grass-like leaves. This lily attracted an unusual amount of attention in our Exhibit at the New York International Flower Show this Spring, for its daintiness and brilliancy.

Price: Per dozen $3.00; 100 $22.50

W. E. MARSHALL'S BOOK

"Consider the Lilies"

Our beautiful book "Consider the Lilies" has been accepted by the world's greatest horticulturists as one of the most authentic and interesting treatises on this great and important Hardy Floral Family. Over 80 reproductions in Natural colors; over 100 varieties fully described with growing directions.



Postpaid $1.00 or free with any order for Lilies amounting to $3.00 or over.

Our Catalogue of Seeds, Bulbs and Plants Mailed on Request

W. E. MARSHALL & CO., INC.
156 West 23rd Street
New York City

Falling Leaves is Nature's Warning that it's time to tuck your garden away for winter
All during the spring, summer, and fall you have taken the bounteous offers Nature has provided in your garden—flowers, fruits, vegetables, beauty! Do you appreciate the colossal effort, the work, your plants have done—and now their need for rest! and protection! This is the one time during all the year when you must do your part if you want that bounteous beauty again next Spring. All evergreens, shrubs, perennials, and lawns need a winter mulch to protect them from the killing winter winds. They need its warmth, its soil building and humus content. Given this they will be protected from winter killing and will come back to you next spring, more able and more willing to continue with the wonderful work. Let us tell you more about this winter mulch in our free descriptive literature. Or better still order a supply of G.P.M. today. G.P.M. is the best medium to use for this purpose. $4 per single bale f.o.b. New York. Prices for larger quantities on request.
Atkins & Durbrow, Inc.
E-25 Burling Slip
New York, N. Y.
PEAT MOSS

freeze-up, soil should be hilled up around them to a height of eight to ten inches. In sections where the winters may be open or changeable a covering of hay or some coarse litter should be applied also to prevent heaving and injury from alternate freezing and thawing.

Many varieties of bulbs may still be planted, in fact this is the ideal time to plant Tulips. Practically all varieties of spring flowering bulbs can go in now and they should be planted by the hundred. In the spring they are doubly welcome when their gay flowers come so soon after the snow is gone. Bulbs are excellent for the beginner in gardening to plant as they have within their heart the flower already formed. In many respects they are the easiest of flowers with which to succeed. Follow instructions carefully as to the proper depth to plant, be sure the soil is well prepared, fine and friable, don't neglect the fact that they must have good drainage and lastly let no manure touch them. Narcissi may still be planted though better results may be expected from them if planted earlier.

Sometimes it is desirable to plant very late in the season when normally the ground would be frozen solidly. This may occur when one has to wait for imported material or goods shipped from a distance. To keep the ground from freezing where this late planting is to be done a heavy blanket of hay or straw may be spread over it. Its thickness will depend upon the severity of the freeze that may be expected. A foot or two of hay should be sufficient in most sections. All material planted very late in the season must be carefully mulched to prevent heaving by the frost.

Large specimen shrubs and trees may be moved with balls of soil when freezing weather arrives. You can dig down around them leaving a sufficiently large ball of soil to include all the roots and then when the soil is frozen a few inches the ball may be taken up and set in a new location with no disturbance to the roots. For large specimens, extremely large balls of soil must be moved and this requires rather elaborate equipment. There are firms who make this their business and know how to move these specimens with ease and safety, guaranteeing them to live. Almost the most important requirement is that the root system shall not be disturbed. Trees moved at this time should be carefully tied so that the gales of winter will not loosen them. They do not become firmly anchored in their new location till a year or more of root growth has taken place. Be sure the guy wires do not injure the bark of the trees.

Did you ever see a garden maker spading his land in the fall? This is a most excellent time for such work and by this very task you can tell if the particular gardener is experienced or not. If he spades and then rakes the surface smooth you will know he is little experienced. The surface should be left as rough and uneven as possible that the freezing and thawing, the snows and moisture of winter may mellow the soil. Heavy clay soils are greatly improved by this treatment. Fall spading also rids the soil of many insect pests as their winter quarters are disrupted and they are killed as the result. Spading also conserves moisture, should the supply be limited, and taking it altogether fall spading is a very wise practice and should be taken

The Story of a Lady's Slipper

A few years ago a customer secured a few of our largest clumps of the native Orchid, Cypripedium pubescens. They did well, but one outbloomed all the rest. After being established three years this specimen bore fifty-one blossoms. So delighted was the customer that she sent us the picture reproduced below.

Will do as well for you!

It is easy to grow our native hardy Orchids in your own garden. Partly shaded, well drained situations, with soil holding leaf mold or humus, exist or are easily created in any home-grounds. To grow the following is to have something exclusive!

C. pubescens. Pale yellow flowers during May and June.

	Each	10	100
1 to 2—crown plants	$ .30	$2.50	$20.00
3 to 4—crown plants	.50	4.50	40.00
Large clumps, 5 to 8 crowns	1.50		

C. acaule. Also called Moccasin Flower. Single, rosy-purple flowers on 12 inch stems.

	Each	10	100
1 to 2—crown plants	$ .25	$2.00	$15.00

C. spectabile. The showiest of the three. Large, rosy purple flowers sometimes turning white. Prefers moist, rich soil in shady places.

	Each	10	100
1 to 2—crown plants	$ .35	$3.00	$25.00
3 to 4—crown plants	.75	6.50	60.00
5 to 8—crown plants	1.50		

Lilies—together with Laurel form charming pictures.

Our native hardy Lilies lend themselves ideally to planting among our native broadleaved Evergreens. Early in the season, these shade the young Lilies which later rise above the foliage, displaying brilliant colors against a shiny background.

Lil. canadense. Yellow or yellowish-red flowers.
Mammoth bulbs, 40c each, $3.00 for 10
Flowering size, 25c each, $1.50 for 10

Lil. philadelphicum. Reddish orange, spotted with purple
25c each, $1.50 for 10, $12.00 for 100

Lil. superbum. Superb Orange Lily
Large bulbs, 25c each, $2.00 for 10, $15.00 for 100

Native Plants Our Specialty

If it is a worthwhile native hardy plant or shrub, you are sure to find it here. Acres in our Nursery are planted to the finest Azaleas, Laurel, Rhododendrons, etc. Our catalog will open to you greater vistas of finer naturalistic gardens. Free for the asking and please mention this publication.

GILLETT'S
FERN AND FLOWER FARM
7 MAIN STREET
SOUTHWICK MASS.

antage of where ground is vacant. One of the most important tasks to be ended to at this time is winter covering. other Nature begins her task early in the l and gradually applies her blanket of ves. In our gardens this is not practical do, in fact experiments have shown that s best not to apply winter covering till surface is frozen and then it should go promptly. We must understand that the nter covering we apply to our gardens is to keep them warm but rather to keep m cold. It is desired to maintain an even nperature throughout the winter without alternate freezing and thawing which the nts would be subject to if unprotected.

The material one uses will depend upon at may be available. Leaves are very com-n but they are not the most ideal cover-. Those from the hard woods like the ks are the best though all leaves are in-ied to mat and smother things when they ome wet. Cornstalks, evergreen boughs l similar things are good where the ncipal function of covering is to keep the w from being blown away. Straw is a od covering material but breaks up badly l generally containing a great deal of ff, is difficult to clean up thoroughly in spring. Hay, this coarse wild kind used packing crockery and other things, is obably the best covering. It "stays put" y well and cleans up easily. If exposed to wind it should be held in place some y.

While the covering should not go on till ground is frozen your supply should be dy to use ahead of time. It should be red in a dry place where it will not get t and freeze solid. I've had that happen bales of hay and they are always much wer thawing out than they are freezing Peat Moss and Buckwheat Hulls make ellent mulching material. The latter is available everywhere but Peat Moss has national distribution now and you can it within reasonable shipping distance. has many uses around the garden and uld always be kept on hand.

n covering be careful not to smother igs as plants must breathe even during winter. Too, you should see that all parts your garden are thoroughly watered just ore freezing up time. "Freezing dry" is equent cause of winter losses. They do want to enter the winter in a pool of er but the soil should be moist to the depth of their roots. The dry falls that e been so common in many sections of country during recent years make this ning timely.

Dr. Wherry Appointed

r. Edgar T. Wherry, for some years cipal Chemist in Charge of the Crop mistry Laboratory, Bureau of Chemistry Soils of the United States Department griculture, has been appointed Associate essor of Plant Ecology in the Depart-t of Botany of the University of Penn-unia. Dr. Wherry, who is a member of Scientific Consulting Board of Nature azine, has achieved national renown his accomplishments in the field of research. He will continue as a mem-of our Board although he leaves for his post with the opening of the current ge year.

Six million Daffodil blooms at our Mile-Front Daffodil Farm at Islip, L. I.

Bulbs for Autumn Planting

for April and May Blooming

Daffodils

Bulbs of the finest varieties are now being produced on our Long Island Farm in as good quality as formerly imported. Following is a Special Offer of:

Six Fine Varieties

Conspicuus ***(Barrii)***—Perianth a pale yellow, cup darker yellow
Lucifer ***(Incomparabilis)*** — Perianth sulphur-white, cup orange-scarlet
Queen of the North ***(Leedsii)***—Perianth clear white, cup primrose-yellow
Sir Watkin ***(Incomparabilis)***—Perianth primrose-yellow, cup darker yellow
Spring Glory ***(Giant Trumpet)***—Perianth clear white, trumpet deep yellow
Vanilla ***(Giant Trumpet)***—Perianth yellow, trumpet deep yellow

Special Collection Offer

10 each of above 6 varieties, 60 Bulbs..$ 7.00
25 each of above 6 varieties, 150 Bulbs.. 15.00
100 each of above 6 varieties, 600 Bulbs.. 50.00

Tulips

Few spring flowering plants rival the May Flowering Tulips for brilliance of bloom. They are a wonderful addition to the flower garden. Following is a Special Offer, including Darwin, Breeder and Cottage sorts;

Ten Fine Varieties

Bronze Queen ***(Breeder)***—Soft golden bronze
Cardinal Manning ***(Breeder)***—Bright rosy violet
Clara Butt ***(Darwin)***—A fine, clear salmon-pink
Edmee ***(Darwin)***—Cherry-rose, lighter border
Farncombe Sanders ***(Darwin)***—Vivid scarlet
Inglescombe Yellow ***(Cottage)***—A rich yellow
Louis XIV ***(Breeder)*** Purple, golden bronze margin
Moonlight ***(Cottage)***—Bright canary-yellow
Painted Lady ***(Darwin)***—A fine white
Rev. H. Ewbank ***(Darwin)***—Soft lavender-violet

Special Collection Offer

10 each of above 10 varieties, 100 Bulbs $ 6.00
25 each of above 10 varieties, 250 Bulbs 14.00
100 each of above 10 varieties, 1,000 Bulbs 50.00

Our Fall Catalog, *"Bulbs for Autumn Planting"*, features the finest Tulips, Daffodils, Hyacinths, Crocus, Lilies and other Miscellaneous Bulbs. Sent upon request.

Branch Stores:
Newark, N. J.
Hempstead, L. I.

Stumpp & Walter Co
30-32 Barclay St., New York

Branch Stores:
White Plains, N. Y.
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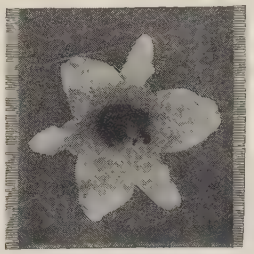
One of the Largest Growers and Importers of Bulbs for Discriminating Flower Lovers in the United States

Superior Dutch Bulbs and Regal Lilies



ONE of the heads of our firm knows personally the people over in Holland, from whom we buy our bulbs. He goes over there every so often, and keeps right in touch with the best worth-while new things. He makes sure we are getting top notch quality. That's the reason our bulbs are so uniformly satisfactory. There is still time to order and plant them. Also the lovely Regal Lilies, of which we have an exceptionally fine lot, priced so you can now buy them freely.

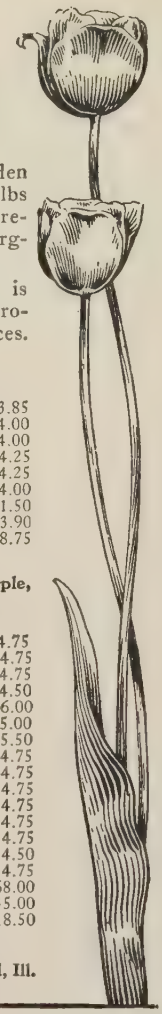
Send for Bulb Catalog. Include 25 cents for booklet of cultural directions. Its cost will be deducted from your first order.

Wayside Gardens
MENTOR, OHIO
Reg. U. S. Pat. Off.

Plan Your Garden with the Help of Nature Magazine's Advertisers

Gorgeous Springtime Blooms

SHUMWAY'S "Pedigreed" Bulbs



You will have a beautiful springtime garden if you plant Shumway's "Pedigreed" Bulbs this fall. They are Holland grown and carefully selected for particular planters. Largest sizes guaranteed.

Our 60-year record of business integrity is your assurance of quality bulbs that will produce gorgeous blooms. Reasonable prices. Delivery charges prepaid.

Superfine Mixtures—Largest Size Bulbs

100 Darwin Tulips	17 Varieties		$ 3.85
100 Breeder Tulips	15	"	4.00
100 Cottage Tulips	12	"	4.00
100 Early Single Tulips	12	"	4.25
100 Early Double Tulips	12	"	4.25
100 Parrot Tulips	5	"	4.00
100 Hyacinths	10	"	11.50
100 Crocus (1¾"—2" dia.)	5	"	3.90
100 Narcissi, U. S. Grown	5	"	8.75

50 Bulbs at the 100 Rate

Extra Special—12 Louis XIV Breeder Tulips, Purple, Gold Margin, 90c; fifty for $3.50; 100 for $6.25

All varieties grow 2 to 3 feet tall. Giant bloom.

100 Princess Elizabeth	Rose Pink	$ 4.75
100 Baronne Tonnaye	Vivid Pink	4.75
100 Bartigon	Carmine Crimson	4.75
100 Clara Butt	Salmon Pink	4.50
100 La Tulipe Noire	Nearly Black	6.00
100 Valentine	Violet	5.00
100 Scarlet Beauty	Scarlet	5.50
100 Inglescombe Yellow	Yellow	4.75
100 Golden Bronze	Name describes it	4.75
100 Farncombe Sanders	Rose Scarlet	4.75
100 Rev. Ewbank	Lilac-blue base	4.75
100 Cardinal Manning	Rosy Violet	4.75
100 Dream	Delicate Lilac	4.75
100 Pride of Haarlem	Carmine Rose	4.50
100 Mme. Krelage	Lilac Rose	4.75
1500 bulbs	100 of each	68.00
750 bulbs	50 of each	35.00
375 bulbs	25 of each	18.50

R. H. SHUMWAY, Seedsman

121 S. First St. *Established 1870* **Rockford, Ill.**

FREE CATALOG

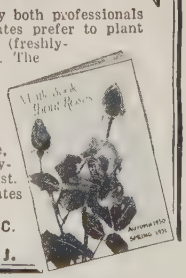
in full colors, pictures a great variety of Tulips, Narcissi, Hyacinths, Crocus, Peonies, Lilies, etc. A helpful guide to gardening, free. WRITE TODAY!

Roses Planted This Fall Will Bloom More Freely Next Summer

ROSES from PETERSON

There are many reasons why both professionals and amateurs in most climates prefer to plant our hardened, field-grown plants (freshly-dug) during October-November. The maximum amount of flowers will well repay your planting efforts this Fall. Simple directions tell you how easily it is done.

"A LITTLE BOOK ABOUT ROSES" the 27th annual issue, is now ready for Rose lovers everywhere and is sent upon request. Residents of Pacific Coast States kindly remit 25c.



GEORGE H. PETERSON, INC.
Rose & Peony Specialists
Box 65 Fair Lawn, N. J.

A Rainbow Garden of Vaughan's May-Flowering Tulips for $2

Since 1876 Vaughan's Seed Store has been one of the largest American importers of bulbs. Florists and private estate gardeners are our largest customers. The expert service which these professionals rely upon to insure quality and value, is available to you.

Our Rainbow Garden of Tulips, postpaid to you for $2, includes 50 bulbs; five each of 10 named varieties of May-flowering tulips, of the Darwin, Cottage and Breeder classes, all first size bulbs.

The Most Beautiful Bulb Catalog

Our **Fall** catalog, "Spring Flowering Bulbs" gives complete illustrated lists of tulips, narcissi, lilies and all other fall bulbs, with descriptions and cultural directions. It is free on request.

VAUGHAN'S SEED STORE
10 W. Randolph St. Chicago
47 Barclay St. New York City

FLOWERING TREES OF THE ORIENT

JAPANESE ROSEFLOWERING AND WEEPING CHERRIES

Flowering Crabs in all varieties and sizes. Azaleas, Evergreen and Deciduous in a large assortment.

Also a complete general line of nursery stock.

Illustrated Book sent free upon request

WOHLERT, of Narberth, Pa.
927 Montgomery Ave.

EVERGREENS

Evergreens, Rhododendron Max., Kalmia, and Hemlock, Seedlings 6 to 18 in., 100, $6; 2 to 4 ft. 25,*$5; 100, $18; Carload for, $150.00.

J. F. NORRIS Doeville, Tenn.

MEET THE PLANETS

(Continued from page 251)

hiding of that star by the moon as it passes between us and the star. The disappearance of Antares behind the moon called, astronomically, its immersion, will take place on October 24 at 3:59 P. M. at Washington and its reappearance or emersion will occur at 5:18 P. M., which is almost exactly the time of sunset at Washington on that day. The disappearance of that star will not be visible as it will take place in daylight but it may be possible to see its reappearance at the bright edge of the thin crescent moon. It is much more difficult to observe a reappearance of a star at the bright edge than its disappearance at the dark edge, so it is probable that the star will already be past the edge of the moon before it is seen. An opera glass will be a great aid in observing this occultation, or better, a small telescope. The occultation, will be visible in the eastern states and eastern Canada and the times will differ by a few minutes in different latitudes but the reappearance of the star will generally be observable in the eastern part of the country close to the time of sunset.

Venus will be at its greatest brilliancy this month on October 18. It is not well placed for observation, however, as it is very far south, setting about an hour after the sun the middle of the month. Mercury reaches its greatest elongation west of the sun on October 7 when it may be seen not far above the eastern horizon at sunrise.

Mars enters Cancer this month and rises about 11 o'clock in the evening. It is now brighter than Antares or Aldebaran. Jupiter now arises about 11 o'clock in the evening in Gemini. It lies a short distance to the west of Mars. Saturn is now in Sagittarius and sets about four hours after the sun the middle of October, but is too low in the south to be seen to advantage.

WREXHAM DELPHINIUMS

GROWN by W. H. WAITE

Bloom from August to freeze-up. Beautiful, tall, stately spikes. Our strong, field-grown plants from best English seed give 100% satisfaction.

75c Each—$8.00 Per Dozen

Order now as Fall is a good time to plant. Orders over $1.00 postpaid.

WAITE'S GARDENS, INC.
Eatontown (Box G), N. J.

50 CALOCHORTUS—$2.25

Western Wild Flower Bulbs—Exquisite shades of creamy-white, Citron, Golden Yellow, Rosy-pink, Lilac. Some beautifully marked with Lilac to deep Wine-purple. Perfectly hardy when mulched. 50 bulbs —$2.25, postpaid.

HARDY BULB SEEDS. Many easy grown varieties. Arums, Freesias, Iris, Liliums, Narcissus. Plant now. Catalog of bulbs and bulb seeds on request.

GORDON AINSLEY Campbell, California

BULBS & PLANTS FOR FALL PLANTING

that are guaranteed

My catalog is FREE. Write for it to-day

J. K. ALEXANDER, The Dahlia King
The World's Largest Bulb Grower
107 Central Street E. Bridgewater, Mass.

NUT TREES FOR FALL PLANTING

Try our hardy grafted varieties. Have a fine assortment of Japanese Flowering cherries, and sweet cherries. 10c for literature. Price sheet, free.

JOHN W. HERSHEY Box 65 I Downingtown, Pa.

NATURE NEWS and VIEWS

Cactus Society

Conservation of water in Southern California may be aided by gardeners if they will plant gardens of cactus and other natives of arid lands, Dr. Jacolyn Manning told the members of the Cactus and Succulent Society of America at their recent meeting. This gathering of this organization devoted to the preservation of these plants was held at the Sierra Madre home of Henry Jaeger and in his extensive desert garden. Dudley Corlett, director of the California Botanic Garden, reported that that exquisite garden is "virtually dead" for lack of funds but that the cactus garden is able to look after itself and is persisting. R. E. Willis, 2721 Bellvue St., Los Angeles, is president of the Society.

Trick Trees

With the increasing number of suburban small gardens it is a wonder that there has not been a greater adoption in this country of the practice of planting fruit trees trained to grow in certain ways and hence fit into a restricted space. European gardens do not lack these, but in America, possibly because nurserymen have not developed this field, they have not gotten into much use. These trees also have an ornamental character fitting well into the general scheme of the flower garden. They are, briefly, developed through a process of grafting on dwarfing stocks which prevent vigorous lateral growths, and may be developed as vines or in other interesting trick ways. Such trained trees bearing apples, apricots, cherries, nectarines, peaches, pears and plums are being developed in this country now and certainly will come into more common use when people hear about them.

Garden Club Reports

Increased tree planting and protection of existing trees, encouragement of zoning plans, improvement of filling stations and food stands, authorization of the expenditure of one per cent of highway department funds for roadside planting, state surveys to establish the exact problems of highway beautification were among the suggestions made by Mrs. C. Oliver Iselin to the annual meeting of the Garden Club of America. These planks in a program were proposed by Mrs. Iselin as Chairman of the Billboard and Roadside Committee and after she had made an encouraging report on the progress of public education with relation to the billboard restriction and roadside beautification campaign. She stated that one of the features of the work that has received general support has been the signing of the pledge that reads: "As a practical protest against the abuse of our countryside by advertising, I shall give special favor to products not advertised on the landscape."

Roses Autumn Planting

Several hundred varieties of Roses, including many novelties, recent introductions, and rare varieties, together with hundreds of older favorites, await an invitation to move to your garden this fall.

We invite your attention to Mrs. G. A. van Rossem, Lady Margaret Stewart, President Herbert Hoover, Everest and Etoile de Hollande in Hybrid Teas; Thelma, pink Climber; and Arrillaga, Hybrid Perpetual.

"ROSES . . . BY BOBBINK & ATKINS"

describes and prices all these Roses. Comments are given on their merits and demerits. All are classified to make selection easy. A copy will be mailed to those who intend to plant Roses, providing you mention Nature Magazine.

Hardy Plants
Fall Planting

You will be amazed at the great variety of Hardy Plants produced in our nurseries. Here are plants for borders, for masses of color, for rock-gardens, for small groups in corners, for ground-covers. In fact, plants for every place and purpose are described and priced in

Hardy Herbaceous Plants

our Special Catalogue, which will be sent on request to those who intend to plant Perennials, provided the Nature Magazine is mentioned.

Alpine Plants
For Rock-Gardens

From the great collection of Alpine Plants in our nurseries, expert and amateur gardeners alike may select varieties to meet every need. Autumn is an ideal time for building a rock-garden and moving the plants. More than two hundred varieties of Alpines are presented in our Catalogue

Hardy Herbaceous Plants

which will be sent on request to those who intend to build a rock-garden, provided you mention Nature Magazine.

In your request for catalogue it is important to state definitely what you intend to plant. We issue several catalogues.

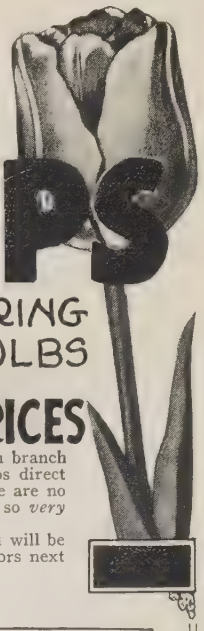
BOBBINK & ATKINS • Rutherford, N. J.

Stassen DARWIN COTTAGE BREEDER TULIPS

DIRECT FROM HOLLAND GROWER at ONE PROFIT ONLY

AND OTHER SPRING FLOWERING BULBS

COMPARE THESE PRICES



Not middlemen—Not brokers.—Stassen Floral Gardens is an American branch of N. V. L. Stassen Junior of Hillegom, Holland and obtains its bulbs direct from the grower. Packed in Holland—unpacked in Roslyn Heights there are no handling charges to increase cost to you. That's why these prices are so *very* reasonable.

The quality is the very best; varieties the latest—selected so that you will be doubly delighted when they bloom in all their wonderfully beautiful colors next Spring. Compare these prices and then send your order.

75	Darwin Tulips	25 varieties.....$3.50
100	" "	4 colors..... 2.90
100	" "	10 " 3.15
100	" "	Rainbow Mixture..... 2.40
66	Single Early Tulips	22 varieties..... 3.80
96	" " "	8 colors..... 3.20
100	Double " "	5 colors..... 3.60
60	Cottage Tulips	10 varieties..... 2.60
100	" "	4 colors..... 2.90
50	Breeder Tulips	5 varieties..... 1.80
100	Crocus	10 varieties..... 2.90
25	Hyacinths	25 varieties..... 2.50
100	"	8 colors..... 6.90
25	Narcissus (Paperwhite)	..... 1.80
100	Narcissus	20 varieties..... 8.50
100	"	for growing wild..... 3.90

CATALOG.—*Write for our Free new catalog of Tulips, Narcissus, Hyacinths, Crocuses, Madonna Lilies, Snowdrops, Chionodoxa, etc.*

ENJOY MORE BLOOMS
Where you had 50 Tulips in 1930 you can now afford 100 for 1931. Prices include all charges prepaid to your door.

A further Discount is allowed on 500 and 1000 lots of those here listed.

STASSEN FLORAL GARDENS

BOX 21, ROSLYN HEIGHTS LONG ISLAND, N. Y.

New! Duckham's Delphiniums

NEW COLORS
NEW TYPES-MASSIVE SPIKES

The acknowledged leaders of American-grown English Delphiniums. A superb strain, of the most recently distributed types, that have won the unstinted praise of flower connoisseurs all over the country. The most coveted awards at leading flower shows have been showered upon them—including two gold medals at the New York Show—the greatest floral display in the country.

Many novel types and delicate colorings, unknown in the ordinary strains, have been inbred by scientific hybridizing. Huge 6 to 8 ft. spikes, in single and double-flowered formation will make your flower borders brighter beyond belief with every shade from lavender and mauve to peacock blue. Their extreme hardiness makes fall planting safe and preferable to spring planting; they establish themselves quickly and bloom earlier and more profusely next year.

Here are my prices for September-October delivery:

Mixed Hybrids, (including many plants that have not yet flowered) Each $1.00; Dozen $11.00; 100 $85.00.

Field-Selected Picked Types, Each $2.00, $3.00, $4.00, $5.00 and $7.50.

My Madison Gardens in Sept. and October will be a riot of color. Drive out if convenient or write for circular.

WILLIAM C. DUCKHAM

Delphinium Specialist

MADISON (BOX N) NEW JERSEY

TULIPS!

The Essence of Springtime is in this Wonderful Offer

100 DARWIN TULIPS $4.00

Choicest first-size bulbs, sure to bloom. Schling's Special mixture made up especially for us from ten of the finest named varieties—not at all the ordinary field-grown mixture usually sold.

A $6.00 value for ONLY $4.00

Schling's Bulbs

Max Schling Seedsmen, Inc.
618 Madison Ave., North, New York City

Plant Wild Flower Seed Now

10c per packet, 12 pkts. $1.00
Soil Testing Set $2.00

36 Colored Post Cards, 25c per doz.
64 Colored Flowers or 48 Tree Stickers 55c
Outline Drawings, 75c per 100

Annual members at $1.50 receive magazine and free Holly plant or 6 pkts. seed; Subscribing members $5.00 and contributing members $10.00 get magazine, Holly and 12 pkts. seed if requested.

WILD FLOWER PRESERVATION SOCIETY
3740 Oliver St. Washington, D. C.

Desert Cacti

5 blooming size plants and 5" Mexican hand painted bowl $2. 10 plants $2. Imported hand made pottery and Mexican hand made Zarapes. Postpaid. Miniature bowl and baby cacti FREE with every order.

BORDER CACTI CO.
Box 1259 El Paso, Texas

PEONIES AND IRISES

A specialty with us for years. One of the largest and most complete stocks in America.

Plant this fall for results next year. A copy of our catalogue in color is yours for the asking.

NORTHBROOK GARDENS INC.
Northbrook, Ill.

What makes a good
PLANT LABEL GOOD?

It must be impervious to moisture, must retain its markings, and must not girdle the Plant—WE HAVE IT.

Sample Line for the Asking

THE AQUAPROOF PRODUCTS CO.
2175 East 76 St. Cleveland, Ohio

EVERGREENS

AND BROAD LEAF FLOWERING EVERGREEN SHRUBS

Choice plants Write for price list

Natures Rhododendron Nurseries
Bert E. Rains Elizabethton, Tenn.

EVERY GARDENER AND GROWER
WANTS TO KNOW how to improve the soil and grow more and finer vegetables, more and better fruit, the finest flowers, plants, trees and shrubs, hot house methods, etc. All told by E. C. Vick in 4 new books that answer problems and assure success. Price $6. Sent free on approval, payable $1 a month if satisfied. Send name today and get books at publisher's risk. Garden folder free. THEO. AUDEL, 65 W. 23 St., New York. Dept V25

A Question of Values

There comes to us an editorial from a Wilmington, North Carolina, newspaper. Which one we do not know because our correspondent cut it out too neatly. It is an excellent editorial related to the question of roadside protection and beautification. It is an editorial worth reprinting in its entirety for the thoughts it expresses and the questions of values it propounds. Here it is:

"Beautiful Prince George's drive, they tell us, is doomed. Condemned to make the highways wider and open a new vista for the billboard, the stately, moss-draped trees are to vanish and future motorists along North Carolina's Route 40 out of Wilmington will gaze instead upon the cosmetic beauty of the cigarette girl.

"Prince George's drive, for the benefit of the stranger within our gates, is a stretch along the Raleigh highway just south of Castle Hayne. Scenically, it is one of the most beautiful drives in the nation. It is and has been one of the show spots of the Carolinas.

"From Wilmington, the highway leads in a gentle curve into the midst of a majestic grove. A cathedral stillness pervades the air. The trees, to the imaginative, become altars. The festoons of Spanish moss are transformed into the draperies. A brook babbles through the center. The restful quiet is perfect. The relief from the brazen billboards is refreshing beyond words.

"One by one our natural beauties are being sacrificed to the great God Speed. Our streams have been polluted by the refuse from our cities; our groves and natural parks have been denuded and strewn with rubbish. The vista from the highway has been cluttered with unsightly posters. Only those wonder spots are safe as have been commercialized for private profit.

"It is with sincere sadness we are informed that one of Wilmington's greatest assets in this respect is to be ruined to make the highway wider. We will not argue with the engineers that it is not better from a mathematical standpoint. We will not debate with the statisticians that traffic is now sufficient to literally demand a widening of the thoroughfare.

"But we still contend there are curves of such indescribable beauty as an engineer may never plot; pictures so perfect that no artist may rival them; and scenic beauty spots designed by Nature herself, which when violated by the hand of man can never be reproduced."

Power Law Change

Amendment of the Federal Power Law to provide for additional considerations that shall govern the Federal Power Commission in granting licenses is asked by the Izaak Walton League of America in a resolution adopted by its Executive Board. This amendment, which in its general provisions merits the support of all conservationists, would direct the Commission to consider certain values not now prescribed. These points, the resolution states, are:

1. To consider the effect upon scenic, historic, recreational and all other public values when passing upon applications for power permits.

2. To secure from government scientific bureaus expert opinion on the effect of each

A glimpse of the show grounds at "Tulipdom" May, 1930

Glimpses of Old Holland in the New World

WOODEN Shoes and Windmills, Tulips and Hyacinths, we had plenty of most of them right along here at "Tulipdom"—*except the Windmill!* And *that* arrived last Spring! It now is our "Welcome" sign to visitors from everywhere. It stands as a symbol of Dutch integrity, a promise to maintain our policy of delivering only

"Bulbs in a Class All Their Own"

Consistent winners of highest awards at all leading Spring Flower Shows, Zandbergen Tulips have won a permanent niche in the hearts of exacting garden hobbyists throughout the land. Write today for

Free Catalog "Greetings from Tulipdom"

Will prove both interesting and instructive. Freely illustrated from photographs, accurately describing the finest quality Tulips in the world, and offering them generally for less than asked by other bulb specialists, it serves as the key to unlock the portal to finer bulb gardens. When writing kindly mention Nature Magazine.

ZANDBERGEN BROS., "Tulipdom"

7 Mill River Road, Oyster Bay, Long Island, N. Y.

Nurseries at Valkenberg, near Leiden, Holland and at Babylon, Long Island, N. Y.

Some Tulips on Hand Now

At prices quoted these varieties represent the greatest Tulip value in a strictly *Quality* product. Compare! There are many other varieties besides those described below, offered in our surplus list for which please ask.

Choice Darwins

Afterglow.—Deep rosy orange edged salmon. A masterpiece at $1.20 per doz.; $8.50 per 100.

Anton Mauve.—Rich violet purple shaded garnet. **$1.10 per doz.; $7.90 per 100.**

Baronne de la Tonnaye.—Bright rose **edged blush. 65c per doz.; $4.40 per 100.**

Clara Butt.—The greatest salmon pink bedder. 75c per doz.; $4.90 per 100.

Pride of Haarlem.—A superb rosy carmine. 75c per doz.; $4.90 per 100.

Princess Elizabeth.—Showy, clear deep rosy pink. 85c per doz.; $5.90 per 100.

Professor Rauwenhoff.—Bright cherry red. 80c per doz.; $5.40 per 100.

A Few Cottage Tulips

Gesneriana Spathulata.—Dazzling crimson-scarlet. 80c per doz.; $5.40 per 100.

Grenadier.—A gorgeous orange-red. 95c per doz.; $6.40 per 100.

John Ruskin.—Salmon rose edged soft yellow. A wonderful flower. 80c per doz.; $5.40 per 100.

Picotee.—The lovely maiden blush—white, edged pink, becoming rose with age. 80c per doz.; $5.40 per 100.

Mrs. Moon.—Rich golden yellow. 95c per doz.; $6.40 per 100.

Sirene.—The rich cerise-pink Lily flowered Tulip. 95c per doz.; $6.40 per 100.

Cardinal Manning.—A magnificent wine-red Breeder. 80c per doz.; $5.40 per 100.

Panorama.—Breeder. Orange shaded mahogany. 80c per doz.; $5.40 per 100.

A Word About Our Daffodils

On our own farm at Babylon, L. I., we now grow quantities of such popular favorites as Emperor, King Alfred, Will Scarlet, White Lady, Lord Kitchener, and scores of others—all in a *quality* bulb product bringing promise of great results. Twelve pages of our catalog are devoted to this most charming of all Spring flowers, which is endearing itself to more garden lovers year after year. Let our catalog acquaint you with all we grow. Write for it today—it's free.

"Tulipdom's" windmill of "Welcome".

PEONIES from PETERSON

"The Flower Beautiful"

No need to wait a year or two for blooms when our undivided roots—large and plump—will produce beautiful flowers next Spring. Hundreds write that we did not disappoint them.

This New Book, the 26th annual issue,

tells the whole story about Peterson's Peonies in an interesting fashion. It is beautifully illustrated in Nature's colors—a valuable handbook on planting, culture, and success with Peonies. Gladly sent free wherever Peonies will grow.

GEORGE H. PETERSON, Inc.

Rose & Peony Specialists — **Box 65 Fair Lawn, N. J.**

Burpee's Bulb Book-free

It tells you of the flowers that will bloom this winter in the house—and those that, planted now, will give you a beautiful garden next spring. Write for a copy of this free bulb book.

W. ATLEE BURPEE CO.
832 Burpee Building, Philadelphia

PLANT RHODODENDRONS THIS FALL

Next spring's glorious blooms of LaBars' Rhododendrons can now be started to advantage. Plant Rhododendrons in that shady spot where grass has difficulty in growing—and put them in this fall. Cold will not kill. The plants are always green. Grow in shade. Lovely blooms May to July according to variety.

Special offer: Twelve plants, 10 different, Rhododendrons and Azaleas, for only $25, packed, F.O.B. Stroudsburg. Cover 40 sq. ft. Wonderful bargain!

LABARS' RHODODENDRON NURSERY
Box M Stroudsburg, Pa.

Plant Maule Bulbs

You can have *gorgeous flowers* early next spring. Plant Maule bulbs this fall. Low cost. Little effort. Wonderful blooms. Tulips, Hyacinths Narcissus, Crocus and many other bulbs for fall planting. Send for Bulb Book today—*Free!*

WM. HENRY MAULE
406 Maule Building
PHILADELPHIA, PENNA.

proposed project on wild life of all types and when granting a permit require the installation of means approved by such government bureaus for preventing the destruction of migratory fishes or other valuable wild life.

3. To require that all licensees cut clean and remove all timber and tree growth from the entire flowage area to prevent unsightly conditions, to minimize the breeding of mosquitoes and other features that endanger health or life, and to remove hazards to the users of such impounded waters for recreational purposes.

4. To require all licensees to allow a sufficient flow of water in the natural stream bed below all dams to maintain not less than the normal ten-year low water flow.

5. To require all licensees to open impounded waters to public fishing, boating, bathing and other recreational uses.

The League also recommends that similar provisions be written into the power and public utility statutes of the States to govern such agencies as may be concerned with the impounding of waters for power purposes.

Service

On May 18, 1930, E. D. Hallock of Weehawken, N. J., found a peculiar growth at the root of an old oak tree which none of the naturalists in the tramping party of which he was a member could identify. On May 19 he bought a copy of June Nature Magazine at a newsstand, and on page 378 found Albert A. Hansen's article on cancer root, which identified the growth he had discovered. That is service.

Springtime Flowers of the Woods

Just as entrancing now as when you used to take them to the teacher's desk, —sometime ago.

If you have a partially shaded corner, or better still, a shaded rock garden, you can plant the bulbs this fall, and be fully repaid with delightful beauty next spring. Here is a fine collection to tempt you:

12 Squirrelcorn (Dicentra canadensis)	$1.00
12 Troutlily (Erythronium americanum)	1.25
12 White Troutlily (Erythronium albidum)	1.00
12 Virginia Bluebells (Mertensia virginica)	2.00
12 Bloodroot (Sanguinaria canadensis)	2.00
12 Painted Trillium (Trillium erythrocarpum)	1.50
12 Snow Trillium (Trillium grandiflorum)	1.50
12 Shootingstar (Dodecatheon media)	2.00
96	$12.25

Until November first we will send you the 96 bulbs as above for just $10.00, or one half of this number, 6 of each, for $5.50.

If you have not already received our catalog of Native North American plants, you may still have a copy for the asking.

And, of course, we also grow an extensive variety of Evergreens, Shrubs, Perennials, and Fruit Trees.

GEORGE D. AIKEN

Box Z, Putney, Vermont

"GROWN IN VERMONT, IT'S HARDY"

25 GORGEOUS DARWIN TULIPS 25c

Most brilliant and beautiful assortment of colors—Pink, Rose, Scarlet, Crimson, Maroon, Lilac, Lavender, Purple, White, Yellow, Mottled and Striped. **25** baby bulbs for **25c; 125** for **$1.00,** postpaid. Bulb growers plant this size for propagating purposes. Don't miss this grand opportunity of getting started with a big planting of Tulips at very little expense.

SPECIAL 2 Hyacinths, each a different color; 1 Narcissus; 1 Iris; 3 Giant Darwin Tulips, each a different color; and 25 Baby Darwin Tulips, all for **$1.00.** All but baby Tulips are large bulbs.

FALL BULB AND PLANT CATALOG FREE. BURGESS SEED & PLANT CO., 340 H. T., GALESBURG, MICH.

Indiana Audubonists

Much interesting material on bird life is packed into the sixty-four pages of the 1930 issue of the Indiana Audubon Society's Bulletin. It testifies to an active membership interested and eager to translate its experiences and observations into readable stories. We note that one of the immediate aims of the Society is to raise funds that the grave of Col. Isaac Washington Brown at Rochester, Indiana, may be properly marked. Col. Brown was popularly known in his lifetime as Indiana's "Bird and Bee Man", and as a pioneer in ornithological education his contribution is one that eminently merits proper recognition of his final resting place. The Bulletin contains a fascinating biography of Col. Brown. The next meeting of the Society, of which Miss Margaret Knox, 4030 Park Avenue, Indianapolis, is secretary, will be held in Muncie.

Protected Plants

The protection of the statutes of the State of New York has been extended to include six additional species of flowering plants. It is now a penal offense to gather fringed gentian, *Gentiana crinita;* closed gentian, *Gentiana andrewsii;* yellow lady's slipper, *Cypripedium parviflorum* and *C. pubescens;* showy lady's slipper, *Cypripedium reginae;* and hart's-tongue fern, *Scolopendrium vulgare.* Commenting on this, the Leaflet of the Brooklyn Botanic Garden says:

"It is gratifying to be able to assign credit for this latest amendment to the New York law to the Syracuse Botanical Club, an organization with a long history of active plant study. Leadership in the formulation and original presentation of the amendment was furnished by Mrs. John Church, the club president. New York State has a particular interest in guarding, so far as possible, the remaining plants of what may be called the rarest fern species in the United States, the hart's-tongue, which is found naturally in only four localities in North America: in Onondaga and Madison counties in New York State; in Tennessee; and in Ontario, Canada."

Nature Guardians Enrolled

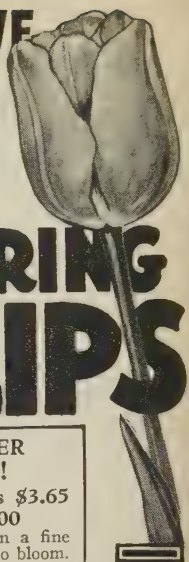
The state of Ohio has six hundred new Nature guardians as a result of a campaign conducted under the auspices of the Shawnee council of Boy Scouts. G. F. Walker, scout executive, and John W. Thompson, head of the division of conservation of the Ohio Department of Agriculture, directed the movement. Each of the "gallant six hundred" signed the following pledge:

"Upon my honor as a Nature guardian, I promise to take care of natural friends, the birds, fish and all useful dumb animals, the flowers, the trees and the forests. I will do my best to protect them from abuse and hard usage.

"I promise not to rob a bird's nest, not to wilfully kill a bird, an animal or a fish in violation of the law, nor to abuse or bully a dumb animal; and I will strive to keep others from doing these things to the best of my ability. I will endeavor to prove myself a friend to all living things that are harmless.

"I will put out camp fires started by myself or others, and I will do my utmost to

ATTRACTIVE OFFER of GLORIOUS MAY-FLOWERING TULIPS



SPECIAL OFFER DARWINS!

100 Mixed Varieties $3.65

$34.00 per 1,000

All large sized Bulbs in a fine variety of colors. Sure to bloom.

GIANT DARWIN TULIPS

Surpass in beauty all May Flowering Bulbs. Place your order now and take advantage of these special prices.

EXQUISITE COLLECTION

	Dozen	100
Baronne de la Tonnaye (Rose Pink)	$ .70	$5.15
Bartigon (Fiery Crimson)	.70	5.40
Clara Butt (Salmon Pink)	.65	4.90
Inglescombe Yellow (Canary Yellow)	.75	5.40
Loveliness (Soft Rosy Carmine)	.75	5.40
Mrs. Potter Palmer (Glowing Purple)	.90	6.90
Pride of Haarlem (Brilliant Carmine Red)	.65	5.15
Rev. H. Ewbank (Vivid Heliotrope Lilac)	.70	5.40
Farncombe Sanders (Geranium Red)	.70	5.15
Princess Elizabeth (Deep Pink and Lilac Fringe)	.65	5.15

SPECIAL COLLECTIONS

12 ea. of above (Value $7.15)	$ 6.50
25 ea. of above (Value $13.50)	12.75
100 ea. of above (Value $54.00)	50.00

Ask for our autumn catalog of bulbs

Bassi Frères Inc. de Paris SEEDSMEN

510 Main Street, New Rochelle, N. Y.

LANDSCAPE & NURSERIES

Boston Post Road, Larchmont, N. Y.

Beautiful Hardy Azalea FREE

The Azalea is one of the most brilliant and beautiful of the early flowering shrubs. Flowers cover the bush when color in the garden is scarce. Add the charm of the Azalea to your garden; use them for foundation planting. Easily grown, but always high priced. We have a large stock to enable us to make this unusual offer.

40 Darwin Tulips $2.00

100, $4.00; 500, $18.00; 1,000, $35.00

Beautiful Big Darwins. Choice assortment of colors. All largest size bulbs. Sure to give perfect satisfaction. This we guarantee.

Separate Colors

Scarlet, crimson, pink, violet, salmon, white, yellow.

40 for $2.25; 100, $4.25; 500, $20.00; 1,000, $38.00

These are as choice bulbs as it is possible to obtain. With each order, a Hardy Azalea will be included FREE.

A Bed of Early Spring Flowers FREE

Grape Hyacinths, beautiful heavenly blue flowers, brilliant soon after the snow goes. Thrive for years in sun or shade. Good for pot culture and cut flowers. Twenty-five choice bulbs FREE in place of Azalea, or Azalea and Hyacinths sent with two orders for 40 Tulips.

Order at once. Write for Catalog of Bulbs, Perennials, Roses, House Plants, Vines, for Fall Planting.

JOHN LEWIS CHILDS SEED CO.

Established 1876

7 Childs Ave. Floral Park, N. Y.

Candidates for the M. B. Degree

Now is the time to start a course in Medicine Ball. No, it isn't like drinking catnip. It's a genuine sport, and, if you haven't played it, you are entirely out of style—healthfully and politically speaking. Aside from being a sport much approved by President Hoover, it is one of the most muscle-building, circulation-toning, fat-removing, blues-killing, back-yard or front-walk games ever invented for sedentary man. Read all about it in the October issue of HYGEIA, the Health Magazine of the American Medical Association. Minnie Martin, who has been a Medicine Ball addict for twelve years, gives in her vivid, humorous style a set of suggestions for making Medicine Ball a wholesome zestful recreation for exercise-starved men and women. Working for your M. B. Degree is real fun.

WHOM

Shall you consult?

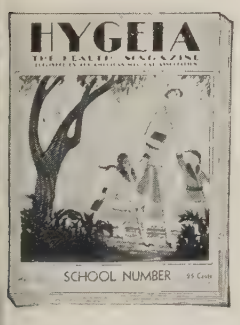
Many people who have trouble with their eyes trot off to the jeweler, who is also an optometrist, and have a pair of glasses fitted. They never dream that the trouble with their eyes might arise from complications in other parts of the body, or that the eye, itself, might require medical attention. *Optician, Optometrist, Occulist, Ophthalmologist, or Ophthalmic Physician,* which one is the man you need? You know that each one has something to do with the treatment of the eyes, but—Dr. McCoy defines these titles for you in the October HYGEIA, helping to direct you to the right person for your eye troubles.

Other Health Topics
of vital interest to you

"Warm Water Healing" tells of a new treatment for paralyzed limbs; **"The Antiquated Coroner System"** explains a blunder in the legal processes of certain cities that is injurious to health and personal welfare; **"Simple Lessons in Human Anatomy"** is a "get-acquainted-with-your-body" series of articles that will help in health preservation; **"Questions and Answers"** is the monthly section of HYGEIA that clears up the health problems of its readers—these are only a few of the health problems treated in HYGEIA. Every topic is written by an authority who talks to you through HYGEIA as he would talk to a friend—in a personal heart-to-heart style that makes the reader want more and more of HYGEIA. Every issue is a gold mine of health information. Clip the coupon, fold a dollar in an envelope and start your subscription to good health now.

SPECIAL

Introductory Offer



HYGEIA
The HEALTH MAGAZINE

6 months *for*

$1.00

$3.00 the year

AMERICAN MEDICAL ASSOCIATION
535 North Dearborn, Chicago Nat-O

Enclosed, find $1.00 for which send me HYGEIA for six months in accordance with your special introductory offer.

Name .....

Address .....

protect forests from destruction, because forest fires not only destroy the trees and underbrush, but also burn birds and animals or their nests and dens.

"I will familiarize myself with the game and fish laws of my state so as to be able to govern my conduct and to advise others, and in every way possible I will do my level best to protect the inhabitants of the great outdoors."

With such leadership, perhaps the adults of the country can be taught, too, to protect their natural heritage.

How It Happened

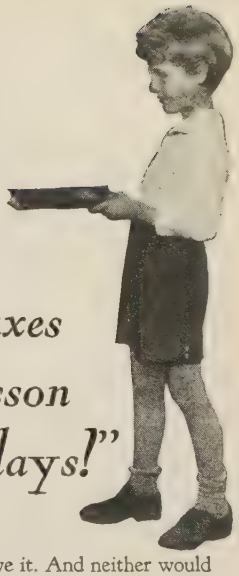
"How did it happen?" queried Carl Krebs, seeking an explanation, in April Nature Magazine, for the growth of a tree with roots several feet above the ground. Joe Drueke of Grand Rapids, Michigan, has an excellent explanation, as a photograph he sent us shows. The dead tree on the ground, he writes, is a cedar and the living one a birch. The roots of the birch go around the log, and when, after a time, the log decays and is blown away, there will be a tunnel two feet in diameter through the roots of the birch, while the main trunk will be elevated like another Eiffel tower several feet from the ground. This answers Mr. Krebs' question—but, suggests Mr. Drueke, how did the birch tree start growing? Perhaps another reader can supply the answer.

The Pink Turtle-Head

In the July number of Nature Magazine there was shown a picture of a pink turtle-head, *Chelone obliqua,* with the statement that it had been rediscovered by Dr. Edgar T. Wherry after having been "lost" for 175 years. Questions have been raised by several of our subscribers as to how this plant could be lost and rediscovered when it is listed in all the manuals of botany, and is known to have been collected by botanists in several different states, having indeed been found by Mr. J. E. Benedict, Jr., in 1917 within 20 miles of the District of Columbia. We have accordingly asked Dr. Wherry to comment on the matter, and the following is his reply:

"The facts relating to the finding of the pink turtle-head have been placed on record in my paper 'Chasing Chelones', which appeared in *Bartonia,* the Proceedings of the Philadelphia Botanical Club, volume II, pages 1 to 11, 1927-28. Miss Chesnut, in the article about my work, included considerable material abstracted from that paper, and while the abstracting was well done, the necessary condensation made it impracticable to explain in detail just what was supposed to have been "rediscovered." In view of the questions that have been raised, the following explanation may be worth publishing.

"A number of species and varieties of pink turtle-heads are indeed well known to botanists, but there has long been an uncertainty as to which of these was described by Linnaeus in his Species Plantarum as *Chelone obliqua.* Linnaeus's specimens had been sent to Europe by John Clayton, who collected in Gloucester and Mathews counties, Virginia, prior to 1750, but so far as could be ascertained by search of the litera-



"Bob coaxes for a lesson on Saturdays!"

"You wouldn't believe it. And neither would I three months ago. You see, we had been worrying about Bob's school for ages.

"Gone all day, learning we didn't know just what, long hours indoors, trips back and forth in any kind of weather . . . well, naturally he was tired and didn't have much interest in studying in the evenings.

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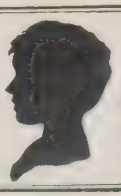

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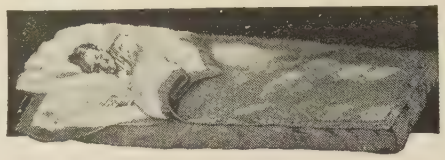

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ture and herbarium records, no subsequent botanist had found a *Chelone* in that region. In September, 1925, Dr. Francis W. Pennell, the authority of this group of plants, joined with me on a trip to those counties, and we were successful in finding a pink turtle-head so near to the site of Clayton's residence that there could be no question as to its being the identical species and variety he had collected. This was what I meant when I wrote in *Bartonia* that we had the 'thrill that comes once in a lifetime'—we had rediscovered a plant lost to science for 175 years."

Mount Hood Tram Authorized

Although two of the three members of a special committee appointed by Secretary Jardine of the Department of Agriculture to study the Mt. Hood region voted against a proposed tramway up Oregon's 11,000 foot peak, Secretary Hyde recently authorized the cableway, construction on which will start at once. The majority view of the committee, composed of Dr. John C. Merriam, Frederick Law Olmstead and Dr. Frank A. Waugh, was that mechanization caused by the tramway would more seriously affect the natural beauty of the country than it would benefit the multitudes who cannot ascend the mountain on foot. In granting the petition which has been long standing, the Secretary said that the Department would insist upon guarantees that the aesthetic and artistic requirements of the site be protected and preserved.

Bird Foresters

The value of birds in preservation of forests is frequently alluded to in general terms. Some less general observations are contained in the report entitled *The Summer Birds of the Northern Adirondack Mountains*, written by Aretas A. Saunders, field ornithologist of the Roosevelt Wild Life Station, New York State College of Forestry, Syracuse University. Mr. Saunders says:

"Nestlings grow so rapidly that in two weeks' time those of certain species are known to have gained six, seven or more times their weight at the time of hatching.*** Imagine the amount of food that would be necessary for a human child if it could grow at a corresponding rate! It is quite probable that birds often eat more than their own weight in food in a single day. The quantity of insect food consumed during the nesting period therefore is relatively enormous.

"Birds nest chiefly in the months of May and June when the annual life cycle of most insects is at its beginning, and consequently the insects captured and fed to the young at this season would total a much larger number in late summer were the birds not there to destroy many of them. Therefore, a nestful of young birds in early summer is a fairly good guarantee that harmful insects in the immediate vicinity would have no chance to develop to destructive proportions. A forest that contains bird life in normal numbers is therefore not likely to suffer from overwhelming numbers of insects," which argues for maintenance, so far as is economically possible, of normal conditions in the management of forests.

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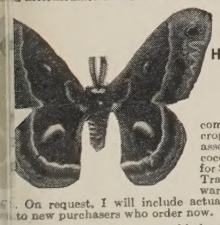

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WASHINGTON'S DOOMED TULIP TREES

(Continued from page 214)

of the most prominent streets of our Capital city, has been virtually ruined? Is it not because we as a nation have lost much of the reverence for trees that was a part of the religion of our half-savage ancestors? And yet annually we print many thousands of pages proclaiming the virtue of trees and the importance of their protection, and we spend many thousands of dollars replanting the areas that we have formerly denuded. But we are more than niggardly in doling out to those to whom we entrust the care of our trees, planted by the wayside where all may see, the means to save for our comfort and inspiration these marvelous creations.

The Capital of our nation, with its hundreds of miles of tree-lined streets and winding highways, a city that should be the fairest in all the land, gives for the support of its trees a sum that is relatively insignificant. There are departments devoted to tree-planting and spraying and removal—and the greatest of these is removal. This very summer gangs of men with ladders and ropes and axes and carts will cut down and carry away the tulip trees that have died during the winter, for such trees soon become a menace to human life. Next year, perhaps sooner, will come the turn of the tree in the next yard whose upraised limbs have lost the power to put forth leaves. Within a few years, at the present rate, the fate of all these hundreds of trees will be as a story that is told, and their glory but a memory in the sorrowing minds of their friends.

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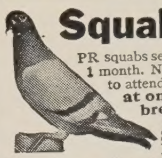

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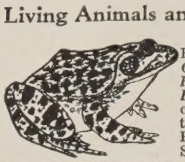

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TREES FOR WASHINGTON BICENTENNIAL MAKE A MEMORIAL ALL CAN ERECT

"THIS country has had nothing finer offered it during recent years," says the Ohio State Journal, "than the plan of the American Tree Association in Washington to have 10,000,000 trees planted in honor of George Washington, the trees, no matter where they are planted, to be the living memorial to Washington on the 200th anniversary of his birth on Feb. 22, 1932." "Here," continues the editor, "would be a memorial of living green, distributed over the nation, the offering of the people in 48 states, indicative of the everlasting love they bear the man whose courage and genius helped found securely the nation.

"The marble is cold, unfeeling; gleaming and brilliant but unresponsive to the busy life about it. The huge piles of stone that are dedicated as a memorial to the great leaders of the land, have their place, but they lack the warmth and thrill of life. It would be different with 10,000,000 trees, from ocean to ocean, trees of all kinds, in all places, each showing a part of the national affection for the Father of his Country. They have the thrill of life about them, would have that desirable quality each day, would live and grow more majestic as the years go by, each anniversary holding their heads higher, swinging their boughs more gracefully. Ten million trees planted, that is not a heavy task for a dozen times that number of men and women and children in the United States. It would give each individual a complete part in a great plan, costing but little, but each would have a wealth of meaning," the editor concludes.

In the same tone editors throughout the country are endorsing the memorial plan put forth by the American Tree Association in co-operation with the bicentennial commission.

"There is perhaps no more useful way for the public marking the passing of 200 years since Washington was born," says the Syracuse Post-Standard. "It will be an activity spread across the country; it will benefit every participating community. The trees will long stand as memorials to one whom the entire nation honors."

"There is something notably appropriate about a campaign of tree planting as an effort in honor of George Washington" is the way the Kalamazoo Gazette puts it and adds: "As Mr. Pack reminds us, the 'Father of his Country' was a woodsman and an all-round lover of the outdoors.

The St. Louis Post Dispatch points to the value of tree planting and says: "As the bicentennial of Washington's birth nears, a campaign is being launched to plant trees in honor of the man too widely known as a tree destroyer. As a matter of fact, Washington's diaries show him to have been a tree planter, with great interest in their propagation and care. The American Tree Association expects 10,000,000 trees to be planted as Washington memorials. If Washington is ever to live down his reputation as a hatchet-toting youth, dangerous to have at large around an orchard, 10,000,000 trees should do the job.

The call to plant is being answered by organizations of national scope too. "I am delighted," says Mrs. Lowell Fletcher Hobart, president general of the National Society of the Daughters of the American Revolution, "that the American Tree Association is to take part in the George Washington bicentennial celebration." Mrs. H. L. Lincoln, state regent for North Dakota adds: "The idea is fine and is worthy of the consideration of every good and loyal citizen." In the opinion of Mrs. F. L. Matthews, chairman of conservation and thrift for the New York D. A. R., "your plan to mark the bicentennial of the birth of George Washington was like a clarion call to arms."

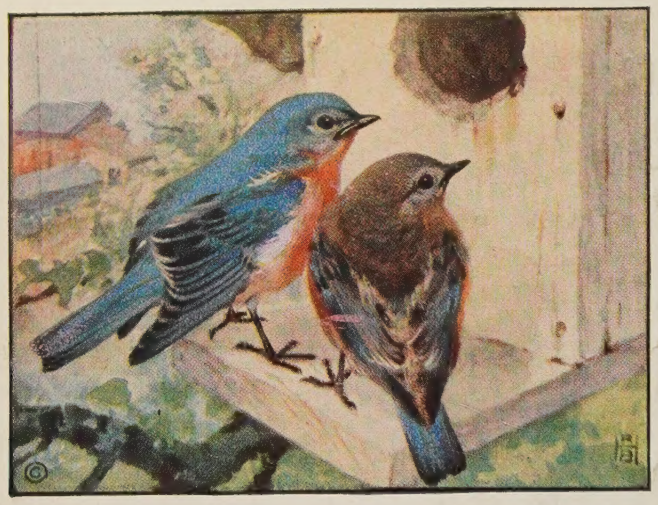
In the Brooklyn Times the editor sets forth the plan of campaign this way: "With the Brooklyn Washington Bicentennial Celebration Committee asking the public to begin preparing now for the celebration in 1932, and with the Brooklyn Tree League calling attention to the general desirability of tree-planting, the appeal of the American Tree Association comes with particular force. That organization is unique. It has no dues. The only way you may become a member is by planting a tree. The Association has jumped into the Washington bicentennial picture with great enthusiasm, it has decided the one way in which the entire nation may celebrate the 200th anniversary of the birth of George Washington is through a general tree-planting campaign. It asks communities, organizations, families and individuals all over the country to be thinking now of planting trees. It is a simple and useful way of celebrating which will appeal to many."

That is exactly what the association is doing. The plans now have reached more than ten million people. The Association is putting in the mail thousands of its new tree planting books. Anyone who plans to plant can have a copy of the planting and program suggestions. Do not wait until 1932 but plant now and in 1931. The idea is to dedicate the planted trees on Washington's birthday.

Further examples of nation wide co-operation come from Rotary International which is calling on the Rotarians to plant for Washington. The Young Women's Christian Association has sent the message to nearly a thousand local associations throughout the land. The Royal Arcanum Bulletin is carrying the announcement as is the monthly magazine of the Virginia Medical Society which shows the varied co-operation being given the tree planting campaign.

The historical committee of the Long Island Chamber of Commerce has taken up the suggestion to plant the route of George Washington's itinerary of Long Island in 1790, Meade C. Dobson reports. In Oklahoma, George R. Phillips, state forester, reports a move to change the state arbor day from March to Washington's birthday. Arbor Day comes on Feb. 22 in Texas now.

The thing to do is to make plans at once. Send for the tree planting book and do your part in honoring the Father of your Country.



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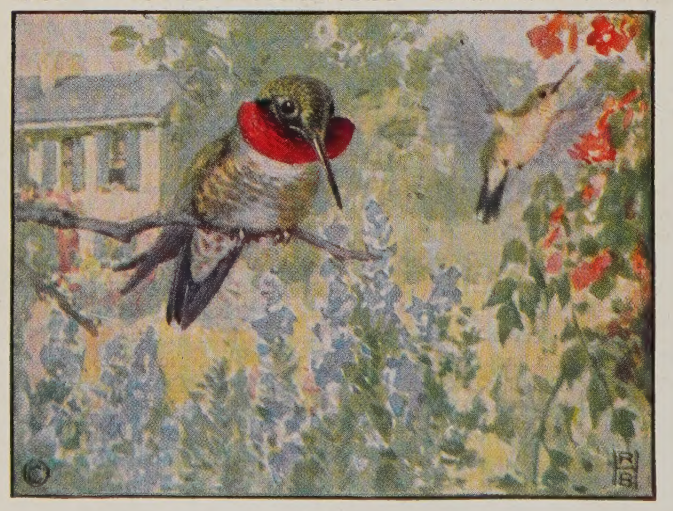

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